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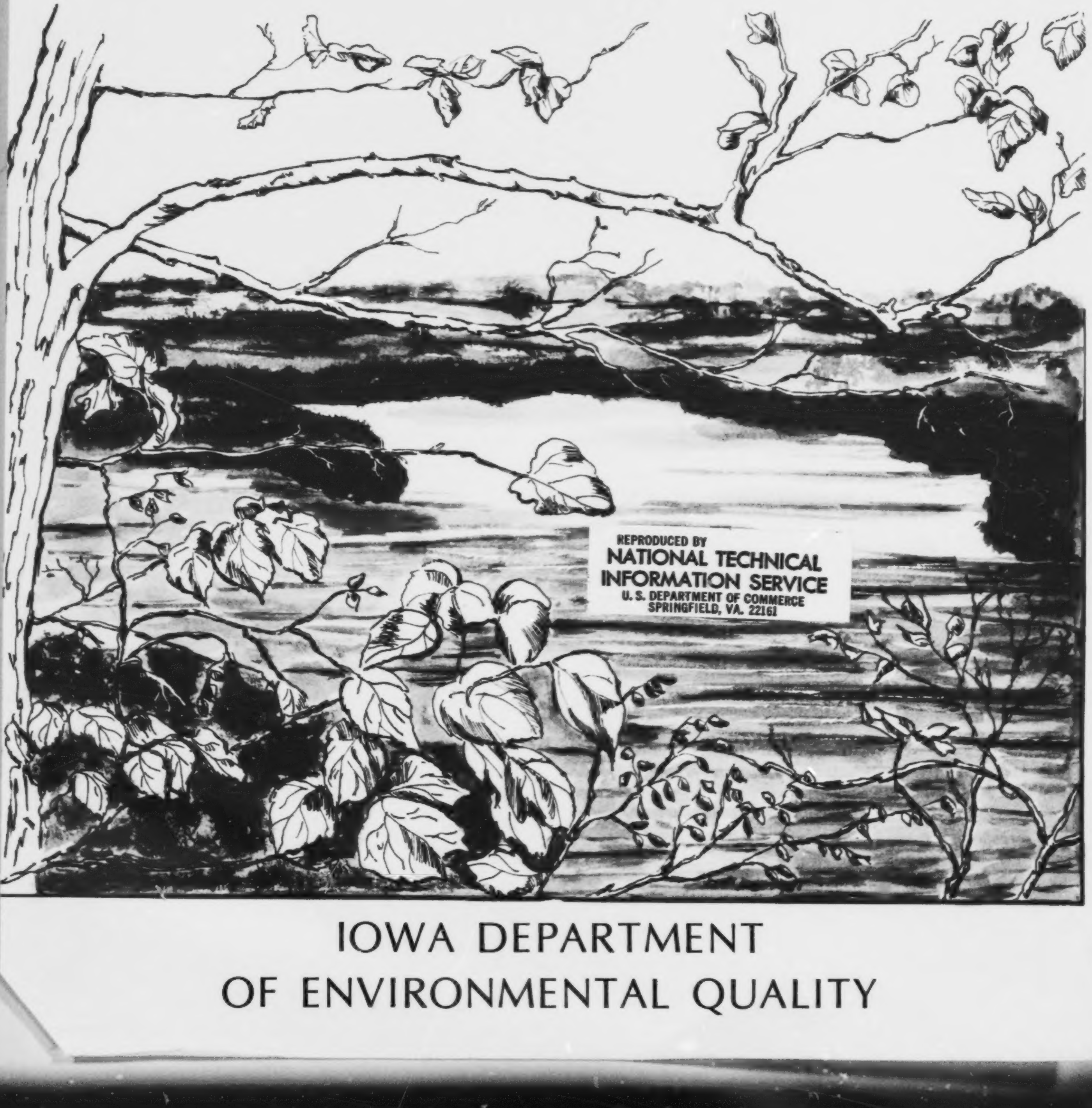
# Iowa Water Quality Report, 1977

Iowa Dept of Environmental Quality, Des Moines

1977

PB 300457

# IOWA
# WATER QUALITY REPORT
## 1977



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IOWA DEPARTMENT
OF ENVIRONMENTAL QUALITY

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16. ABSTRACT

Water quality data is reviewed for the years 1975 and 1976, including assessments, impacts, violations and costs. Most recent program revisions are updated and a complete discharge inventory for the State of Iowa is included. Each basin was reviewed and note was taken when point and nonpoint impacts were affecting the rivers during the time of sampling.

17. KEY WORDS AND DOCUMENT ANALYSIS

| a. DESCRIPTORS | b. IDENTIFIERS/OPEN ENDED TERMS | c. COSATI Field/Group |
|---|---|---|
| Des Moines River Basin, Iowa, Iowa-Cedar River Basin, Northeastern River Basin, Skunk River Basin, Southern River Basin, Water Quality Data, Western River Basin | | |

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# WATER QUALITY REPORT

Prepared by the

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY
Chemicals and Water Quality Division
Planning Section

April, 1977

as required by
Section 305(b) of FWPCA 1972

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# FORWARD

The purpose of this report is to identify, by basin, the status of Iowa's water quality, based on available data. The water quality data was derived from studies conducted by the State Hygienic Laboratory, quarterly monitoring stations, and United States Geological Survey. Only those basins where water quality data has been collected are discussed. The data used in this report covers a period from January 1975 to January 1977.

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# INTRODUCTION

Pursuant to Section 305(b) of the 1972 Federal Water Pollution Control Act Amendments (Public Law 92-500), this report addresses the present quality of the waters of the State of Iowa. The goal of the water pollution effort in Iowa is "swimmable and fishable waters" by 1983. Attainment of this goal is measured through the use of the water quality classifications and the water quality standards which have been established. This report shows the efforts Iowa has made toward that goal since the 1975 Water Quality Report.

The 305(b) section of the "Clean Water Act" requires the following information:

1) A description of the current status of water quality within the state.

2) An analysis to determine to what extent water quality allows for a balanced aquatic community and recreation in the state.

3) An analysis to determine to what extent pollution control programs have improved water quality and provided for the goals of fishing and swimming.

4) A description of additional control programs needed to achieve water quality commensurate with the uses described above.

5) An analysis to determine what costs are associated with these pollution control programs and what benefits will be achieved.

Data from January 1974 through January 1977 are used in this report to illustrate existing water quality conditions in Iowa.

# SUMMARY

Water quality in the State of Iowa is generally good. Problems are still being experienced below point sources along rivers which have major municipalities and industries.

The Department of Environmental Quality contracted with the University Hygienic Laboratory to conduct surveys along various streams during the period covered in this report. The streams were sampled at various levels (high, moderate, and low flows) to determine the quality of the water during stress situations. Quarterly monitoring stations were also maintained at 36 sampling sites, throughout the state, to help give a feel for the general quality of water in each of the major river basins. Some United States Geological Survey data was also used for those areas where intensive surveys were not done.

Water types vary throughout the state. Several cool water trout streams are located in the Northeastern Basin and are generally considered to be of high quality and high importance statewide. North central and north western Iowa have a number of lakes created by the Wisconsin glacial formations. These lakes are generally of high quality and considered a high priority for protection by the State of Iowa. The waters of the southeast are in sedimentary soils and have been channelized a great deal. Water quality in these streams is considered poor to moderate in nature. The Corps of Engineers have four major reservoirs located in the Des Moines, Iowa-Cedar and Southern Basins. The quality of the water in these reservoirs is being constantly monitored by Iowa State University and the University of Iowa.

With the extremely large amount of agricultural practices being employed in the State of Iowa, nonpoint pollution is a major problem. At the time of this report, an interim report for the Iowa 208 program has been published with some suggestions for Best Management Practices (BMP). Work in determining amounts of pollutants entering the streams and amounts of soil losses are being conducted in cooperation with the Department of Soil Conservation and the University Hygienic Laboratory throughout the State. The original 208 Plan in Iowa is expected to be completed in the early part of 1979, although specific activities, particularly those addressing nonpoint, will continue.

The Environmental Protection Agency has recently approved the Iowa NPDES proposal and is considering the pretreatment proposal submitted by the State. It is hoped that now that Iowa has the NPDES program, it will improve the quality of water below industrial and municipal point sources.

The combined effort of both the 208 program and the NPDES will result in an overall improvement in the quality of water in the State of Iowa. To assure this coordination, the 5-year strategy in 208 will identify how water quality management processes will be used to achieve goals to the extent possible. The 1983 goal of fishable and swimmable waters may be attained if a continuation of our program can be attained.

# Section I.

## Iowa Water Quality and Costs

To determine the water quality in Iowa, data from intensive surveys on stream segments and from the thirty-six (36) fixed quarterly monitoring stations has been evaluated. This data was collected by the University Hygienics Laboratory (UHL) from January 1974 through January 1977.

This section has been divided into the six major river basins: 1) Northeastern Basin, 2) Iowa-Cedar Basin, 3) Skunk Basin, 4) Des Moines Basin, 5) Southern Basin, and 6) Western Basin. The following information is provided for each basin:

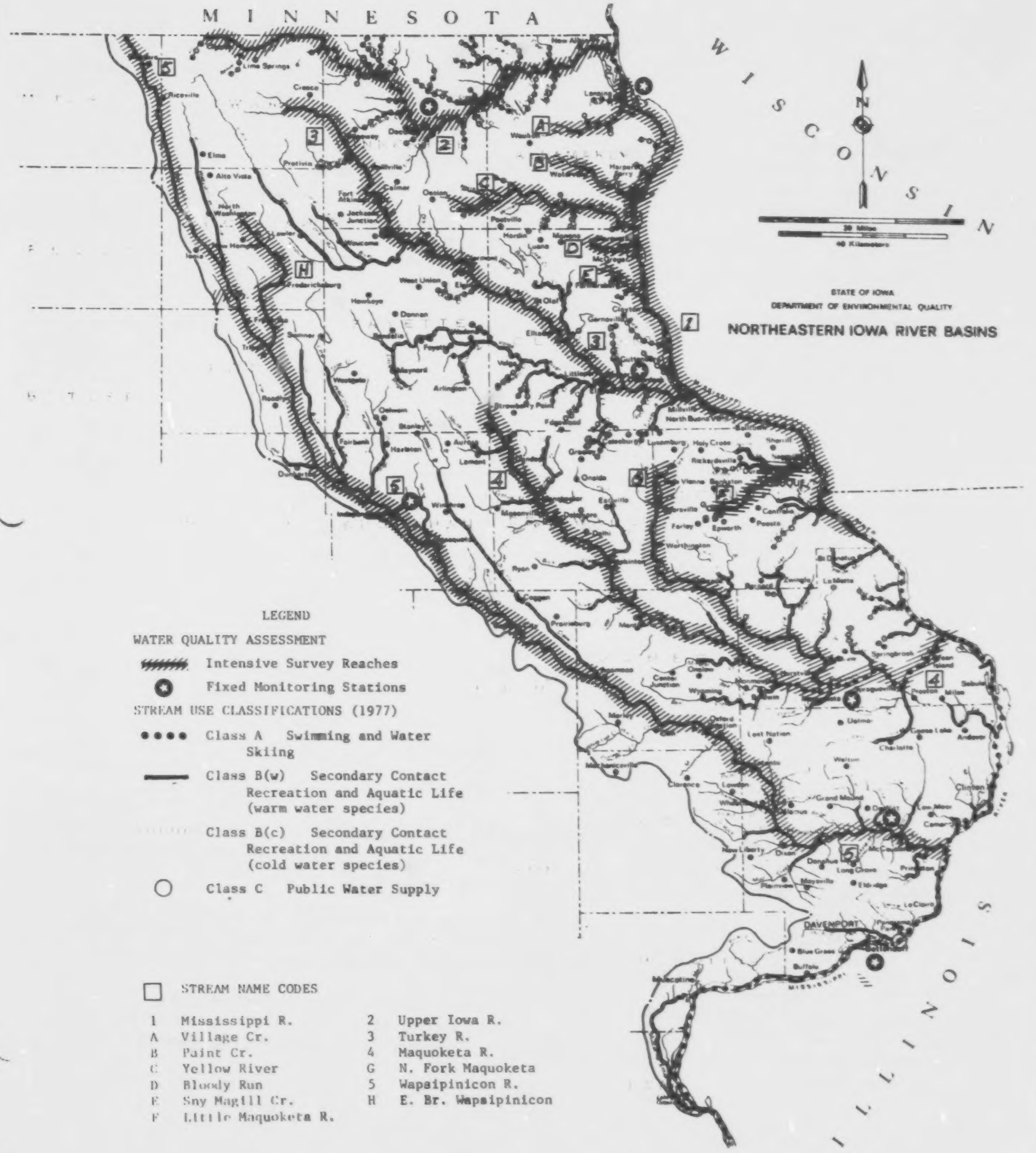
1. A summary of the intensive survey and fixed station data available for the above time period, and future data needed to best evaluate water quality improvements.
2. A summary of water quality violations and their effect on the stream segment.
3. Point source treatment needs and nonpoint source control needs which are necessary to meet the water quality goals.
4. A listing of those municipalities and industries which have upgraded treatment facilities over the last four years and the construction costs associated with the upgrade.
5. A listing of those major municipalities and industries which require a treatment facility upgrading. Projected construction costs are also included.

# REPORT
# ON
# IOWA SURFACE WATER QUALITY
# 1978

## NORTHEASTERN IOWA RIVER BASINS

Iowa Department of Environmental Quality
Chemicals and Water Quality Division

VII


MINNESOTA
WISCONSIN
ILLINOIS
N
20 Miles
40 Kilometers
Lime Springs
Cresco
Riceville
Elma
Alta Vista
Protivin
Calmar
Ossian
Postville
Fort Atkinson
Jackson Junction
Waucoma
Lansing
Waukon
Waterville
Harpers Ferry
Monona
Luana
McGregor
West Union
Elgin
Fredericksburg
Hawkeye
Donnan
Sumner
Oelwein
Fayette
Arlington
Strawberry Point
Elkader
Garnavillo
Guttenberg
Millville
North Buena Vista
Balltown
Holy Cross
Luxemburg
Rickardsville
Sherrill
Dubuque
Farley
Epworth
Peosta
Worthington
Aurora
Lamont
Stanley
Winthrop
Ryan
Coggon
Prairieburg
Wyoming
Oxford Junction
Lost Nation
Delmar
Preston
Miles
Sabula
Goose Lake
Andrew
Charlotte
Welton
Clinton
Low Moor
Camanche
Grand Mound
Clarence
Lowden
Wheatland
Mechanicsville
Calamus
New Liberty
Dixon
Donahue
Long Grove
Maysville
Eldridge
Princeton
Le Claire
Davenport
Bettendorf
Blue Grass
Buffalo
Muscatine
Mississippi
1
2
3
4
5
A
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C
D
E
F
G
H

STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHEASTERN IOWA RIVER BASINS

LEGEND

WATER QUALITY ASSESSMENT

▨ Intensive Survey Reaches

✪ Fixed Monitoring Stations

STREAM USE CLASSIFICATIONS (1977)

•••• Class A Swimming and Water Skiing

— Class B(w) Secondary Contact Recreation and Aquatic Life (warm water species)

Class B(c) Secondary Contact Recreation and Aquatic Life (cold water species)

○ Class C Public Water Supply

☐ STREAM NAME CODES

| | | | |
|---|---|---|---|
| 1 | Mississippi R. | 2 | Upper Iowa R. |
| A | Village Cr. | 3 | Turkey R. |
| B | Paint Cr. | 4 | Maquoketa R. |
| C | Yellow River | G | N. Fork Maquoketa |
| D | Bloody Run | 5 | Wapsipinicon R. |
| E | Sny Magill Cr. | H | E. Br. Wapsipinicon |
| F | Little Maquoketa R. | | |

## NORTHEASTERN IOWA RIVER BASINS
### Water Quality Summary

| | WQ Class. (Water Use) | WQ Problems | Expected to Meet WQ Goals - Point Source Treatment Needs | Nonpoint Source Control Needs |
|---|---|---|---|---|
| Mississippi River | A,B(W),C | 5,7 | BPT | 3 |
| Cold Water Tribs. | B(C) | None(Pt.Source) | | N/A |
| Upper Iowa River | A,B(W),AD | 5 | AWWT | 3 |
| Cold Water Tribs. | B(C) | NCD | | |
| Village Creek | B(C) | None(Pt.Source) | None | N/A |
| Paint Creek | B(C),B(W) | 1,2,3,5 | AWWT | N/A |
| Yellow River | B(C),B(W) | None(Pt.Source) | BPT | N/A |
| Cold Water Tribs. | B(C) | NCD | | |
| Turkey River | B(W),B(C),AD | 5 | AWWT | 3 |
| S. Cedar Creek | B(W),B(C) | NCD | | |
| Volga River | B(W) | NCD | | |
| Cold Water Tribs. | B(C) | NCD | | |
| Roberts Creek | B(W) | NCD | | |
| Otter Creek | B(C) | NCD | | |
| Little Turkey R./ Crane Creek | B(W) | NCD | | |
| Little Maquoketa River | B(C),B(W) | None(Pt.Source) | BPT | N/A |
| Maquoketa River | A,B(W) | 5 | BPT | 3 |
| Cold Water Tribs. | B(C) | NCD | | |
| North Fork Maquoketa | B(W) | 7 | BPT | 3 |
| Wapsipinicon River | A,B(W),B(C) | 3,6,7 | BPT | 2 |
| Buffalo Creek | A,B(W) | NCD | | |
| Otter Creek | A,B(W) | NCD | | |
| Little Wapsipinicon/ Buck Cr. (Buchanan Co.) | B(W) | NCD | | |
| E. Br. Wapsipinicon | B(W) | 1,3,5 | BPT | N/A |
| Little Wapsipinicon R. (Chickasaw Co.) | B(W) | NCD | | |
| Duck Creek (Scott Co.) | B(W) | NCD | | |
| Crow Creek (Scott Co.) | B(W) | NCD | | |
| Muscatine Slough | B(W) | NCD | | |

WQ Classification (Water Use): A, Swimming and Water Skiing; B, Aquatic Life and Secondary Contact Recreation; (W) Warm Water Aquatic Species; (C) Cold Water Aquatic Species; C, Public Water Supply; AD, Antidegradation.

WQ Problems: 1, Dissolved Oxygen; 2, Ammonia; 3, Nutrients; 4, Salinity, Alkalinity, Acidity; 5, Fecal Coliform, Point Source; 6, Fecal Coliform, Nonpoint Source; 7, Turbidity, Suspended Solids; 8, Toxic Substances; 9, Temperature; NCD, No Current Data.

Point Source Treatment Needs: BPT, Best Practicable Control Technology; AWWT, Advanced Wastewater Treatment - treatment beyond standard secondary.

Scale of Nonpoint Source Control Needs: 1, Major; 2, Extensive; 3, Minor; NA, Not Known.

## NORTHEASTERN IOWA RIVER BASINS

### Data Needs Summary

| | Intensive Surveys | | Fixed Stations | | | | |
|---|---|---|---|---|---|---|---|
| | Current Data Available | Data Needs Priority | Existing | | Recommended Additions/Relocations/Deletions | | |
| | | | Location | Value | | Location | Priority |
| Mississippi River | Yes | 4 | Lansing<br>Davenport<br>Keokuk | Good<br>Good<br>Good | | | |
| Cold Water Tribs. | Few Streams | 3 | | | | | |
| Upper Iowa River | Yes | 1 | Decorah | Good | | | |
| Cold Water Tribs. | No | 3 | | | | | |
| Village Creek | Yes | 4 | | | add | Mid-reach | High |
| Paint Creek | Yes | 4 | | | add | nr. Mouth | Low |
| Yellow River | Yes | 4 | | | add | nr. Mouth | Med. |
| Cold Water Tribs. | No | 3 | | | | | |
| Turkey River | Yes | 1 | Garber | Good | add | nr. Clermont | Med. |
| S. Cedar Creek | Yes, at 1 sta. | 2 | | | | | |
| Volga River | Yes, at 1 sta. | 3 | | | add | nr. Mouth | High |
| Cold Water Tribs. | No | 3 | | | | | |
| Roberts Creek | Yes, at 1 sta. | 2 | | | | | |
| Otter Creek | Yes, at 1 sta. | 2 | | | | | |
| Little Turkey River/ Crane Creek | Yes, at 1 sta. | 3 | | | add | nr. Mouth | Low |
| Little Maquoketa River | Yes | 4 | | | add | nr. Mouth | Low |
| Maquoketa River | Yes | 5 | nr. Maquoketa | Good | | | |
| Cold Water Tribs. | No | 3 | | | | | |
| North Fork Maquoketa | Yes | 4 | | | add | nr. Mouth | High |

Northeastern Iowa River Basins
Data Needs Summary, continued

|  | Intensive Surveys |  | Fixed Stations |  |  |  |  |
|---|---|---|---|---|---|---|---|
|  |  |  | Existing |  | Recommended Additions/Relocations/Deletions |  |  |
|  | Current Data Available | Data Needs Priority | Location | Value |  | Location | Priority |
| Wapsipinicon River | Yes | 4 | Independence | Good | add | nr. Frederika | Med. |
|  |  |  | DeWitt | Good |  |  |  |
| Buffalo Creek | No | 3 |  |  | add | nr. Mouth | Low |
| Otter Creek | No | 3 |  |  |  |  |  |
| Little Wapsipinicon/ Buck Cr.(Buchanan Co.) | No | 3 |  |  | add | nr. Mouth | Low |
| E. Br. Wapsipinicon | Yes | 2 |  |  | add | nr. Mouth | Low |
| Little Wapsipinicon (Chickasaw Co.) | No | 3 |  |  |  |  |  |
| Duck Creek (Scott Co.) | No | 2 |  |  |  |  |  |
| Crow Creek (Scott Co.) | No | 3 |  |  |  |  |  |
| Muscatine Slough | No | 3 |  |  |  |  |  |

Intensive Survey Priorities:

1. Urgent
2. Needed to assess suspected problem
3. No recent information, but no unusual problems suspected
4. Recent data available, but current trend information desirable
5. Can be deferred until after point source upgrading

MISSISSIPPI RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Low turbidity and suspended solids upstream, higher downstream | Low Nutrient levels, except near major discharges | TDS relatively low | DO high. BOD low, except near major discharges | Fecal coliform low, except near major discharges |

Fixed Quarterly Monitoring Stations 1975-1976

## At Lansing

Elevated values: None. Ammonia (0.1-0.35 mg/l), BOD (2-4 mg/l), suspended solids, (2-76 mg/l), Turbidity (3-20 JTU), Fecal Coliform (30-250/100 ml). D.O. was slightly below saturation (6.1-6.8 mg/l summer, 11.2-12.3 mg/l winter). Manganese, barium, zinc and silver were detected, but below standards limits.

## At Davenport Water Works Intake

Elevated values: Fecal coliform (100-4200/100 ml), ammonia (as high as 1.9 mg/l, but no violation of standards). BOD (3-4 mg/l). Turbidity and suspended solids were generally low. Manganese, barium, chromium, copper, lead and zinc were detected, but below standards limits.

## At Lock and Dam 19 at Keokuk

Elevated values: Fecal coliform (210-3200/100 ml), suspended solids (as high as 1307 mg/l), turbidity (180-240 JTU). Ammonia (0.12-0.6 mg/l) and BOD (2-4 mg/l) were both low. Manganese, barium, copper, lead, zinc and nickel were detected, but below standards limits.

Intensive Surveys

August 1976 - moderately low stream flow (.3 - .4) x ave. flow

Water quality was sampled at Lansing, McGregor and Dubuque. The quality, which was almost identical at all three locations, was very good. At these below average flows, no significant alteration of quality appeared between Lansing and Dubuque. Typical values for some of the parameters observed were: DO 10.6 mg/l, fecal coliform 10/100 ml, soluble phosphate 0.14 mg/l.

July and August 1974 - moderately low flow

This survey, prompted by several incidents of public health significance, was limited to the Dubuque area. No serious problems were observed in terms of chemical quality, although DO values were somewhat reduced below the Dubuque municipal discharge. At lower flows in warmer weather, however, more serious DO excursions might occur. A survey of aquatic organisms showed significant degradation on the Iowa side of the river for about eight miles below the discharge. Probably the most significant problem noted was high bacterial contamination reaching the entire sampling area on the Iowa side. Fecal coliform increased below the Dubuque area marinas, and more significantly below the Dubuque municipal discharge.

Monitoring Near the Quad-Cities Nuclear Generating Station*

Studies to determine the impact of the power plant cooling water discharge have been conducted since 1968 on pool 14, about fourteen miles north of the Davenport-Rock Island area. The studies, at river flows greater than 9,000 cfs, covering both pre- and post-operational periods (discharge began in 1972), have shown that the thermal discharge has had negligible impact on the river. Water quality in the area is considered good. Including seasonal variations, the ranges of various water quality parameters are: DO (6.3-17.3 mg/l, or 73-112% saturation), ammonia (0.01-1.0 mg/l), nitrate (0.14-0.45 mg/l), soluble orthophosphate (0.004-0.1 mg/l), BOD (1.0-7.1 mg/l) and COD (19-28 mg/l). A diverse and productive standing crop of warm water fish, as well as other aquatic organisms and plants, are found in the area. However, prolific aquatic life is not supported in the main channel where there is scoured sand bottom.

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* Independently conducted and published by Commonwealth-Edison Company.

## Conclusion

The Iowa reach of the Mississippi is generally considered to have good water quality, but there are pockets of degradation. It has been often noted that point source wastes flow in a plume near the Iowa bank before eventually dispersing. The river is large enough that though localized contamination can be found, the vast majority of the water volume appears to be unaffected. This was again affirmed by the 1974-76 data, which showed good quality except for significant degradation, particularly bacterial contamination, in the short reach below Dubuque. Similar conditions and also biological slimes and alteration of the populations of aquatic organisms have been observed, and no doubt still occur, in localized reaches below the other large cities on the Iowa side. Data from the fixed station at Keokuk also suggest that suspended solids and turbidity increase below Davenport. There is no clear explanation, but this effect is not inconsistent with observations of nonpoint source affected water quality entering from the Iowa-Cedar, Skunk, and Des Moines River Basins.

## Forecast

Few of the planned industrial and municipal waste treatment construction projects have been completed. Although chemical water quality is meeting standards, the major discharges must be improved before the known adverse bacteriological and biological impacts can be eliminated. The construction projects are scheduled for completion in 1978 and 1979, however, and fishable-swimmable criteria should then be met in full. Improving the nonpoint source related problems will depend on the effectiveness of controls implemented on the interior streams.

## Data Needs

### Quarterly Monitoring Stations

The existing stations are adequately sited (upstream, mid reach and downstream) for assessing general water quality, although they do not very well monitor individual point sources. The USGS maintains water quality monitoring stations at Clinton and Keokuk, so there is some duplication of effort. In view of the outstanding water use resource and corresponding monitoring needs, however, and in view of the long water quality history provided by the existing state stations, they should be retained in use to continue the record.

### Intensive Surveys

Because of the Mississippi's large dilutional capacity, the impact of most discharges is difficult to measure by conventional sampling, so high priority should be given to intensive aquatic life surveys. Existing problem areas have been identified, so monitoring should now be directed at assessment of point source clean up effects. Surveys should be scheduled for individual affected reaches as new treatment plants come on-line, beginning at Muscatine.

## MISSISSIPPI RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | Discharge P.E. After | Construction Cost |
|---|---|---|---|
| | **1974** | | |
| Camanche | 1,625 | 260 | $ 673,000 |
| | **1975** | | |
| Clinton Corn Processors @ Clinton | 147,180 | 56,430 | --- |
| DuPont @ Clinton | 26,400 | 9,710 | --- |
| | **1976** | | |
| Armour-Dial Inc. @ Ft. Madison | 1,540 | 860 | --- |
| Collis Co. @ Clinton | A | A | --- |
| Ft. Madison (munic) | 15,780 | 2,980 | 4,498,000 |
| Muscatine (munic) | 42,310 | 14,490 | 16,422,000 |
| TOTAL | 234,835 | 84,730 | $21,593,000 |
| | **1977** | | |
| | None | | |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

A = Toxic Waste Reduction

## MISSISSIPPI RIVER

### TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Burlington (munic) | 7,900 | 5,350 | $14,313,300 |
| Chemplex Co.<br>@ Clinton | 2,600 | 2,450 | --- |
| Chevron Co.<br>@ Fort Madison | A | A | --- |
| Clinton (munic) | 87,200 | 13,750 | 7,360,000 |
| Consolidated Packaging Co.<br>@ Ft. Madison | 6,325 | 1,570 | --- |
| Davenport (munic) | 184,100 | 27,000 | 24,240,600 |
| John Deere<br>@ Dubuque | B | B | --- |
| Dubuque (munic) | 177,000 | 16,800 | 14,098,500 |
| Grain Processing Co.<br>@ Muscatine | 165,500 | C | --- |
| Guttenburg (munic) | 3,450 | 490 | 944,000 |
| Hawkeye Chemical Co.<br>@ Clinton | A | A | --- |
| Hubinger Co.<br>@ Keokuk | 1,084,600[D] | 79,800[E] | --- |
| Keokuk (munic) | 48,000 | 7,500 | 6,566,700 |
| LeClair (munic) | 1,960 | 680 | 1,547,800 |
| Monsanto<br>@ Muscatine | 36,800 | 6,150 | --- |
| West Burlington (munic) | 600 | 570 | 4,388,300 |
| TOTAL | 1,806,035 | 162,110 | $73,459,200 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

A = Ammonia reduction.

B = Toxic substances reduction.

C = Discharge to be treated by the Muscatine Municipal Treatment Plant.

D = 149,100 PE discharged to stream, 935,500 PE discharged to Keokuk Municipal Treatment Plant.

E = 7,800 PE to be discharged to stream, 72,000 PE to be discharged to Keokuk Municipal Treatment Plant.

# UPPER IOWA RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Low turbidity and suspended solids, except 10 mile reach above mouth | Low nutrients. Phosphates limiting | Well below critical levels | Unaffected by oxygen demanding loads | Consistently low in harmful substances. Elevated fecal coliform below Decorah. |

Fixed Quarterly Monitoring Stations 1975-1976

Above Decorah

Elevated values: None. Ammonia (0.01 to 0.08 mg/l), BOD (1-8 mg/l), fecal coliform (10-200/100 ml), TDS (8-113 mg/l), turbidity (2.6-27 JTU), D.O. (near saturation), heavy metals (barium, nickel, zinc detected but well below standards limits).

Intensive Surveys

July 1974 and March 1975 - below avg. stream flows, (4-10) x 7 day $Q_{10}$

Overall water quality was good, and concentrations of chemical constituents were generally consistent summer and winter and from station to station. Those variations that were observed were attributed to differences in ground water recharge characteristics and winter versus summer biological phenomena. The aquatic macroinvertebrate community was characterized by high total numbers, reasonable diversity, and absence of large numbers of pollution tolerant forms. The survey at the higher of the two stream flow conditions showed that the effect of chemical constituents from the Decorah wastewater treatment plant effluent was barely discernible, and at the lower stream flow was apparent but not pronounced, and well within standards. Fecal coliform levels were, however, significantly high below Decorah, and well above the standard limit.

Conclusion

With the exception of fecal coliform, water quality is better than standards. The Decorah wastewater treatment facility effluent should be disinfected. Antidegradation procedures should be rigorously followed.

Forecast

With upgrading and disinfection of the Decorah discharge, the stream will meet all fishable-swimmable water quality criteria except during periods of high rainfall-runoff. Turbidity will probably continue to be noticeable in the reach below Lane's Bridge (lower 10 miles) because of erodible soil conditions.

## Data Needs

### Quarterly Monitoring Station

Data from the fixed station correlates well with the intensive survey data during non-runoff conditions. The station should be retained to monitor antidegradation efforts.

### Intensive Surveys

This is a river with unique and outstanding water quality and recreational value, but has not been well studied. Further intensive surveys are warranted, particularly at periods of higher stream flow when affected by runoff. The several cold water classified tributaries to the Upper Iowa presumably also have excellent water quality, but very little information has been documented. Any Upper Iowa intensive surveys should therefore include tributary sampling.

### UPPER IOWA RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | |
|---|---|
| NONE | 1974, 1975, 1976, 1977 |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Cresco | 696 | 274 | $ 1,500.000 |
| Decorah | 4,290 | 2,388 | 3,596,000 |
| TOTAL | 4,986 | 2,662 | $ 5,096,000 |

## TURKEY RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Low turbidity. | Low nutrient loads. | Well below critical levels. | Good dissolved oxygen. | Infrequent detection of hazardous substances. |

Fixed Quarterly Monitoring Stations 1975-1976

At Garber

Elevated values: None. BOD (1-11 mg/l), fecal coliform (100-1000/100 ml), and turbidity (2-32 JTU) were low. DO values were high (near saturation). Barium, lead and zinc were detected, but below standards limits.

Intensive Surveys

October 1975 - moderately low stream flow, (3) x 7 day $Q_{10}$

Water quality was good. Ammonia, suspended solids, soluble phosphate, BOD, COD and turbidity were all low. Fecal coliform numbers were also low, except at a station immediately below Elkader, where the standard was exceeded (5200/100). DO values were supersaturated, except in the headwaters area where it was slightly below saturation. Pesticide levels were low (near the lower limits of detection), and of the heavy metals, only barium, nickel and zinc were detected, but below standards limits. Sampling of the aquatic invertebrates showed the community to be dominated by species associated with good water quality. Samples taken near the mouth of several tributaries* showed water quality to be good - very similar to the mainstem Turkey.

June 1976 - moderately low stream flow, (5) x 7 day $Q_{10}$

Overall water quality was good. Ammonia, soluble phosphate, BOD, COD and turbidity were all low. Fecal coliform exceeded standards in the far upstream reach, probably because of cattle pasturing, but decreased to acceptable levels in the mid and downstream reaches. DO was moderately below saturation upstream, but steadily increased to supersaturated conditions in the downstream reach. Barium and zinc were detected, but below standards limits. Copper equalled or exceeded the allowable maximum at three locations, but there is no known explanation for these levels, since there are no known dischargers of heavy metals upstream. Samples taken near the mouth of several tributaries* showed water quality to be good and very similar to that of the mainstem Turkey.

## Conclusion

These surveys, and the sparse amount of historical data that exists, indicate that this is a high quality stream. It also has attractive physical qualities for recreational use, so deserves a high level of protection. It is not greatly affected by point source loads, but the few existing discharges should be upgraded to state of the art effectiveness and high levels of reliability to insure against water quality degradation.

## Forecast

Fishable-swimmable criteria are being met, and with careful point and nonpoint source waste management, the stream should continue to be an exceedingly high quality resource.

## Data Needs

### Quarterly Monitoring Stations

Data from the station at Garber correlate adequately with intensive survey data. This station monitors most of the basin, and is effectively located at the site of a USGS flow measuring station, so should remain in the network at the present location. However, the Turkey basin water quality is of sufficient significance that stations should be added. There should be a fixed station on the Volga River and one in the upper reach of the Turkey, perhaps near Clermont.

### Intensive Surveys

Since so little data are available for drought flow or runoff effected conditions, additional intensive surveys should be scheduled. Such surveys should include sampling of tributaries also, in order to improve the data base for Northeast Iowa water quality.

* Turkey River Tributaries included in the intensive surveys:

Little Turkey River (Clayton Co.), Peck Cr., S. Cedar Cr., Elk Cr., Volga River, Roberts Cr., Otter Cr., Little Turkey River (Fayette Co.), Bohemian Cr.

Sampled at only one station immediately above the mouth of each tributary.

## TURKEY RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | | Construction Cost |
|---|---|---|---|---|
| | Before | | After | |
| | | 1974 | | |
| West Union | 1,290* | | 730 | $1,205,300 |
| | | 1975 | | |
| | | NONE | | |
| | | 1976 | | |
| Wadena | NPETP | | 100 | 86,900 |
| | | 1977 | | |
| | | NONE | | |
| TOTAL | 1,290 | | 830 | $1,292,200 |

### TREATMENT FACILITY UPGRADE NEEDED

(Major Discharges)

None

NPETP - No Prior Existing Treatment Plant.

PE - Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

* Total for north and south plants.

## MAQUOKETA RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Low turbidity | Low in nutrients | Below critical levels | Good dissolved oxygen | Fecal coliform increases below discharges. |

Fixed Quarterly Monitoring Station

Below Maquoketa

Elevated values: Fecal coliform consistently high (up to 41,000/100 ml). Ammonia (0.01-0.08 mg/1), soluble phosphate (0.02-0.12 mg/1), BOD (2-9 mg/1), COD (2-33 mg/1), and turbidity (4-34 JTU) were all low. DO near saturation (75-96%) winter, supersaturated (163%) summer. Barium and zinc were detected, but below standards limits.

Intensive Surveys

Maquoketa River, October 1975 - low stream flow, (2) x 7 day $Q_{10}$

Overall water quality was good. Ammonia, soluble phosphate, BOD, COD and turbidity were low, except that moderate increases in soluble phosphate, TDS and turbidity were noted immediately below Manchester. High fecal coliform levels, a chronic problem, were found below Maquoketa. Nitrate was moderately abundant. DO was near saturation. Pesticide levels were near the lower limits of detection and, of the heavy metals, barium, nickel, lead, and zinc were detected, but below standards limits. A sampling of the aquatic invertebrate community showed generally good conditions. Samples taken near the mouth of several tributaries* also showed good water quality - very similar to that of the mainstem Maquoketa.

North Fork Maquoketa, July 1974 and February 1975 - low stream flows

Water quality was good. No standards violations were noted in either survey. A relatively high fecal coliform count (6100/100 ml) was reported from the summer survey in the unclassified extreme upper reach, but coliform levels were low throughout the remaining length of stream. No adverse impacts from point sources were detected. Ammonia-nitrogen and the oxygen demand indicators were low, and dissolved oxygen levels were near saturation concentrations. The surveys were conducted during non-runoff conditions, and as would be expected, no pronounced nonpoint source effects were noted. Suspended solids and turbidity were low throughout much of the river's length. However, nitrate was abundant during both surveys and the summer survey showed elevated total solids concentrations in the lower 1/3 of the stream. This was attributed to the contribution of tributaries entering the North Fork, in effect greatly expanding the total drainage area of the stream. The summer biological sampling showed a small diversity of aquatic species, particularly in the lower reach. This may well reflect the impact of heavy solids loads carried and deposited during previous runoff periods.

## Conclusion

The overall physical, chemical, and biological quality was good at the relatively low stream flows occurring during the survey periods. The stream is not greatly affected by point source loads, but some adverse effects were again noted below the two largest discharges, the city treatment facilities at Manchester and Maquoketa. The stream has good dissolved oxygen recovery capability and is low in nutrients. Heavy metals problems have not been detected, although there is a potential source at Manchester which must be carefully managed to insure against degradation. Nonpoint source effects have not yet been adequately assessed, but the small diversity of biological species found in the North Fork suggests that runoff carried silt loads may be a problem.

## Forecast

Fishable-swimmable water quality standards are being met, but point source waste treatment upgrading needs have been identified. Needs for additional nonpoint source controls are likely also. Careful water quality management will provide improvement, and the river should continue to be of high quality.

## Data Needs

### Quarterly Monitoring Stations

Data from the station near Maquoketa correlate well with intensive survey data. The station monitors most of the basin, including the North Fork, and is located at the site of the USGS flow gaging station, so should be continued. However, the North Fork has a large enough drainage area to warrant separate monitoring, so a station should be added to the network, probably between Lytle Creek and the mouth of the North Fork.

### Intensive Surveys

Future surveys should be aimed at identification of nonpoint source problems. Point sources should also be monitored carefully, but low flow surveys will be of lower priority until after the planned treatment upgrades have been completed.

* Tributaries included in the Maquoketa River intensive surveys: Deep Creek, Prairie Creek, Bear Creek, Mineral Creek, Buck Creek, Plum Creek, Honey Creek, S. Fork Maquoketa River.

One sample taken near the mouth of each tributary.

## MAQUOKETA RIVER BASIN

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | | Discharge P.E. After | Construction Cost |
|---|---|---|---|---|
| | | 1974 | | |
| | | NONE | | |
| | | 1975 | | |
| Hopkinton | 2,620 | | 965 | $454,400 |
| | | 1976 | | |
| | | NONE | | |
| | | 1977 | | |
| Greely | NPETP | | 48 | $117,100 |
| | 2,620 | | 1013 | $571,500 |

### TREATMENT FACILITY UPGRADES NEEDED

### (Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Associated Milk Producers, Inc. @ Arlington | 810 | 390 | --- |
| Dyersville | 800 | 630 | $1,176,000 |
| Hopkinton | 970 | 340 | 530,000 |
| Manchester | 3,490 | 970 | 958,800 |
| Maquoketa | 6,320 | 920 | 1,990,700 |
| Monticello | 1,060 | 980 | 1,255,300 |
| TOTAL | 13,450 | 4,230 | 5,910,800 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.
NPETP - No Prior Existing Treatment Plant.

## WAPSIPINICON RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High Turbidity and suspended solids during runoff | Elevated non-point nutrients | Moderate TDS | Good D.O. | Elevated fecal coliform during runoff |

Fixed Quarterly Monitoring Stations 1975 - 1976

At Independence

Elevated values: turbidity (110 JTU) and iron (1500 ug/l). BOD (3-8 mg/l) was low. DO levels were near saturation both summer and winter. Barium, copper, lead and zinc were detected, but below standards limits.

Near DeWitt

Elevated values: turbidity (96 JTU) and suspended solids (200 mg/l). D.O. levels were near saturation both winter and summer. Barium, copper, lead and zinc were detected, but below standards limits.

Intensive Surveys

February 1974 - low to average stream flow, (4-43) x 7 day $Q_{10}$

This was the first of a three part survey conducted during different seasons and stream flow conditions. This February segment found ice cover and low stream flow in the upper two thirds of the river, while the lower third was in mostly open water with higher stream flow. Water quality was excellent throughout the length of the river. In the upper part there was low oxygen demand, low nutrient concentrations, low turbidity and suspended solids, and low fecal coliform levels. The water quality in the lower reach was still very good. Dissolved oxygen, which had been somewhat depressed (60-75% of saturation) under the upstream ice cover, had increased downstream to the 80% of saturation level.

June 1974 - average to high stream flow, (30-190) x 7 day $Q_{10}$

This early summer survey found runoff conditions following heavy rainfall in the upper third of the river, and the nonpoint source related water quality values showed it. Turbidity (at 990 JTU) and suspended solids concentrations were very high, and the nitrogen and phosphorus nutrient levels and fecal coliform counts were well elevated. The mid-reach area had not received the heavy rainfall and the upstream runoff had not yet reached the segment, so water quality was much better. Turbidity was only 25 JTU and the other nonpoint source indicators were reduced in like proportion. At one of the downstream stations, localized runoff from light precipitation had resulted in moderately elevated turbidity (50 JTU), and like increases in fecal coliform and nitrate concentrations. Dissolved oxygen concentrations were at the saturation level the whole length of the stream.

August 1974 - low to below average stream flow, (4-13) x 7 day $Q_{10}$

This late summer survey found relatively low stream flow and good overall water quality. There was, however, a moderate increase in fecal coliform count below Anamosa. The sample results showed that biological processes were active. Nitrate and soluble phosphate were lower than in other seasons, and the relatively high COD with low BOD attest to large algal populations. Dissolved oxygen levels were above the saturation point the whole length of stream. A qualitative type survey of aquatic life was also conducted during this trip. The number and diversity of invertebrate species was in most places very good, and at stations where there were not abundant populations, the condition was attributed to stream flow rate fluctuations, siltation, or lack of habitable substrate, rather than detrimental water quality.

September 1976 - very low stream flow, (near) 7 day $Q_{10}$
(East Branch Wapsipinicon River)

This survey was limited to one sample at each of seven stations on the East Branch Wapsi only. The stream has been subject to chronic water quality problems because of industrial and domestic waste discharges from the Fredericksburg area. Overall, the water quality was good and standards were being met, but there was significant contamination immediately below Fredericksburg in the form of increased nutrient levels (including ammonia) and a slight decrease in dissolved oxygen. The D.O. recovered within approximately five miles. Fecal coliform was not tested. Judging by the good water quality, the Fredericksburg area waste treatment plants were probably operating well on the day of the survey. Subseqent discharge monitoring, however, has shown that treatment efficiency is inconsisent, and future surveys may again show degradation.

## Conclusion

Water quality standards are being met, and overall the Wapsi demonstrates a high level of water quality under a variety of stream flow rates and temperature conditions. Point source impacts are minimal, although a number of discharges in the basin must be upgraded to meet state of the art BPT standards. More importantly, adverse nonpoint source effects were demonstrated by the presence of large numbers of fecal coliform, high turbidity, elevated concentrations of nitrogen and phosphorus nutrients, and high chemical oxygen demand.

## Forecast

Point source related water quality should be excellent. Upgrading the major discharges will eliminate the localized D.O. sags and fecal coliform contamination. The nonpoint source effects will be more difficult to correct, however, and the turbidity and runoff carried contamination may well continue to be noticable.

## Data Needs

### Quarterly Monitoring Stations

The fixed station results correlated well with the intensive survey findings. The two stations are well spaced on the river and located at the sites of USGS flow gaging stations, so should remain in the network at their existing locations. Addition of an upper basin station would be desirable, however, as would be stations on the larger of the tributaries.

### Intensive Surveys

There is a very minimal quantity of water quality data for the Wapsi, so it should be surveyed again as soon as resources permit. Furthermore, there is virtually no data for some of the larger tributaries, so any future Wapsipinicon River surveys should include at least mouth samples from Buffalo Creek, Otter Creek, Little Wapsipinicon River/Buck Creek in Buchanan County, the Little Wapsipinicon River in Chickasaw County, and others. Pollution of the East Branch Wapsipinicon has been a chronic problem, so a resurvey there should have high priority.

## WAPSIPINICON RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | | Construction Cost |
|---|---|---|---|---|
| | Before | | After | |
| | | 1974 | | |
| Frederika | NPETP | | 13 | $ 95,200 |
| | | 1975 | | |
| | | NONE | | |
| | | 1976 | | |
| Meinerz Creamery @ Fredericksburg | 23,500 | | 671 | --- |
| | | 1977 | | |
| Aurora | NPETP | | 48 | 126,650 |
| Stanley | NPETP | | 30 | 72,550 |
| TOTAL | 23,500 | | 762 | $294,400 |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. | | Projected Cost Construction |
|---|---|---|---|
| | Current | Required | |
| Anamosa | 498 | 498 A | $ 217,400 |
| Fredericksburg | 1,092 | 210 | 796,000 |
| Independence | 4,110 | 2,298 | 4,759,000 |
| TOTAL | 5,700 | 3,006 | $5,772,400 |

NPETP - No Prior Existing Treatment Plant.

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

A = Upgrade required to meet secondary treatment standards consistently.

## OTHER NORTHEASTERN IOWA STREAMS
### Tributaries to the Mississippi River

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Low turbidity. | Low nutrient levels. | Below critical levels. | High dissolved oxygen. | None detected. |

Fixed Quarterly Monitoring Stations

None

Intensive Surveys

August 1976 - moderately low stream flows
The purpose of this investigation was to compile at least a minimal data base for northeastern Iowa "small stream" water quality. It is generally accepted that the far northeastern corner of the state is a relatively clean stream region, but firm water quality data for a vast majority of the surface waters are nearly non-existent. The streams selected for this survey are some of the more important ones in terms of recreation and aquatic life, but they are hydrologically and geologically similar to a good many others. The surveyed streams are also typical to the region, in that they receive few point source discharges. It was therefore anticipated that if the findings of this survey were similar from stream to stream, it might be possible to assume similar water quality throughout the region. The survey was conducted during non-runoff conditions and at relatively low stream flows, so nonpoint source affects were not anticipated. The Little Maquoketa River is the only one of the surveyed streams with continuous flow measurement. Based on the Little Maquoketa data, it was assumed that stream flows over the region were relatively low, but well above extreme dry weather rates. Results of the survey follow:

Village Creek - Class B(C)

- The upstream sampling point was very near the headwaters where the contributing drainage area is only 8 square miles and the stream flow rate was very low. The water was characterized by very low concentrations of suspended materials and turbidity combined with high hardness, which is typical of shallow groundwater quality in the region. The BOD, volatile solids and organic nitrogen concentrations, while low enough to constitute good surface water quality, were somewhat above what would be expected in groundwater, which suggests some input of organic material to the stream. Fecal coliform was also elevated (2800/100 ml), possibly because of dairy cattle pasturing common to the area. At the downstream station where the contributing drainage area is 50 square miles and flow volume had increased, the suspended solids and turbidity were equally low and the concentrations of the organic material indicators were lower than above. Fecal coliform count was down to 60/100 ml. Dissolved oxygen concentrations were above the saturation level at both stations, and water temperature was 19 degrees C and 20 degrees C. This was excellent water quality.

### Paint Creek - Class B(W) lower reach; B(C) mid reach

This stream was sampled in each of the three differently classified segments. In the uppermost reach, where the stream is not classified and the minimum water quality "General Criteria" apply, the water was heavily contaminated. The effluent from the Waukon wastewater system makes up a large portion of the stream flow at this station. There were high levels of fecal coliform, ammonia, and BOD. In the mid-reach where the stream is classified for cold water aquatic life, conditions were much improved. The flow rate was significantly increased by the influx of groundwater, which had reduced the temperature to 17°C and effectively diluted the contaminants to quite acceptably low concentrations. Water quality in the lower reach, classified for warm water quality, was essentially equal to if not better than that found in mid-reach. Dissolved oxygen concentrations were high at all locations.

### Yellow River - Class B(W) most of the length; B(C) upper end

Water quality was, in general, excellent the whole length. As seen on Village Creek, there was some indication of bacteriological and organic input at the extreme upstream station, probably because of direct livestock access, but the contamination reduced in concentration as the stream traversed to the Mississippi. One station also showed the effect of groundwater recharge, through lowered temperature and increased dissolved mineral concentration. Suspended solids and turbidity concentrations were low. Algal growth was evident, bright sunshine prevailed, and there were high dissolved oxygen levels.

### Bloody Run (Clayton Co.) - Class B(C)

Samples showed excellent water quality, except for a fecal coliform count of 1600/100 ml at the lower of the two stations. Suspended solids and turbidity, oxygen demand, and nutrient levels were very low, while dissolved oxygen was high. Temperature was 19°C and 17°C and the hardness and dissolved solids indicator levels were high, indicative of the groundwater source of the stream.

### Sny Magill Creek (Clayton Co.) - Class B(C)

Water quality conditions were very similar to those on Bloody Run, except that there was no elevated fecal coliform count. Temperatures were 22°C and 21°C, which is slightly higher than the cold water temperature standard. However, this was a natural condition rather than the result of any wastewater input. The samples were taken in the early afternoon of a 28°C (82°F) August day.

### Little Maquoketa River - Class B(W) most of the length, B(C) near headwaters

Sampling results from one of the upstream cold water classified reaches, were similar to those from the other cold water stream headwaters - slightly elevated bacterial and organic levels, high hardness and dissolved solids concentration, and supersaturated dissolved oxygen, all of which were acceptable. The water temperature was 29°C, which is 9°C higher than the standard, but this condition was again attributed to shallow water, sunshine, and high late afternoon August air temperature. Further downstream in the warm water classified segment, samples were acceptable and improving (from upstream to downstream) in water quality. One station showed a fecal coliform count of 1400/100 ml and one station showed a nitrate concentration of 1.7 mg/l, but in general there were low bacterial, nutrient, and oxygen demand levels, low suspended solids and turbidity, and supersaturated dissolved oxygen.

## Conclusion

The survey confirmed that the northeastern Iowa "small stream" waters are for the most part of excellent quality. The data were sufficiently similar from stream to stream to suggest a pattern. Typically, there was improvement from upstream to downstream. In and near the headwaters the quality is nearly that of the ground water source, but with measureable yet acceptable levels of contamination with fecal coliform and organic materials, probably attributable to bordering soils and direct livestock access to the stream. As the water traverses downstream, the contaminants are reduced by both dilution with ground water recharge and the action of chemical and biological processes. Turbidity and suspended solids concentrations are low, and dissolved oxygen concentrations are near or above the saturation point. The geology and hydrology of the region are such that the streams have good sustained base flow from ground water input. There are numerous spring sources. The groundwater influx was made evident at many of the stations by findings of high dissolved solids and hardness levels and lowered water temperature. The only point source pollution was observed in an unclassified upstream reach of Paint Creek. The stream rapidly recovered to good quality, however, due in part to dilution but probably aided significantly by the stream's steep gradient and excellent reaeration capability, which are attributes typical to the region. There are point source discharges on tributaries to the upper reach of the Yellow River (from Luana and Postville) and in the lower reach of the Little Maquoketa, but adverse effects were not detected.

## Forecast

These streams are presently meeting and for the most part exceeding water quality standards. They provide an exceptional fishing and recreational resource and deserve a high level of protection. With careful and stringent water quality management, degradation can be prevented.

## Data Needs

### Quarterly Monitoring Stations

Data are sorely needed on cold water trout streams, but fiscal constraints limit the number of streams that can be monitored. It would be advisable, however, to monitor an example of such a stream, and addition of a station on perhaps Village Creek (near the Mississippi River, Lansing Station) should have high priority. Stations would also be desirable on Paint Creek and the Yellow and Little Maquoketa Rivers, but would have lesser priority.

### Intensive Surveys

Intensive surveys of others of the smaller streams are needed in order to broaden the northeastern Iowa water quality data base. It would also be advisable to revisit one of the streams included in this low flow survey, at a time when runoff affected samples can be collected, in order to assess nonpoint source impacts.

## OTHER NORTHEASTERN IOWA STREAMS
### Tributaries to the Mississippi River

### TREATMENT PLANT UPGRADES COMPLETED

| | Discharge P.E.<br>Before | <br>After |
|---|---|---|
| | **1974** | |
| | NONE | |
| | **1975** | |
| | NONE | |
| | **1976** | |
| Mississippi Valley Milk Producers @ Luana | 8,938 | 557 |
| | **1977** | |
| | NONE | |

### TREATMENT PLANT UPGRADES NEEDED
### (Major Discharges)

| | Discharge P.E.<br>Current | <br>Required | Projected Cost Construction |
|---|---|---|---|
| Postville (Industrial Waste) | 522 | 474 | --- |
| Waukon | 1,866 | 480 | $1,145,400 |
| TOTAL | 2,388 | 954 | $1,145,400 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

# REPORT

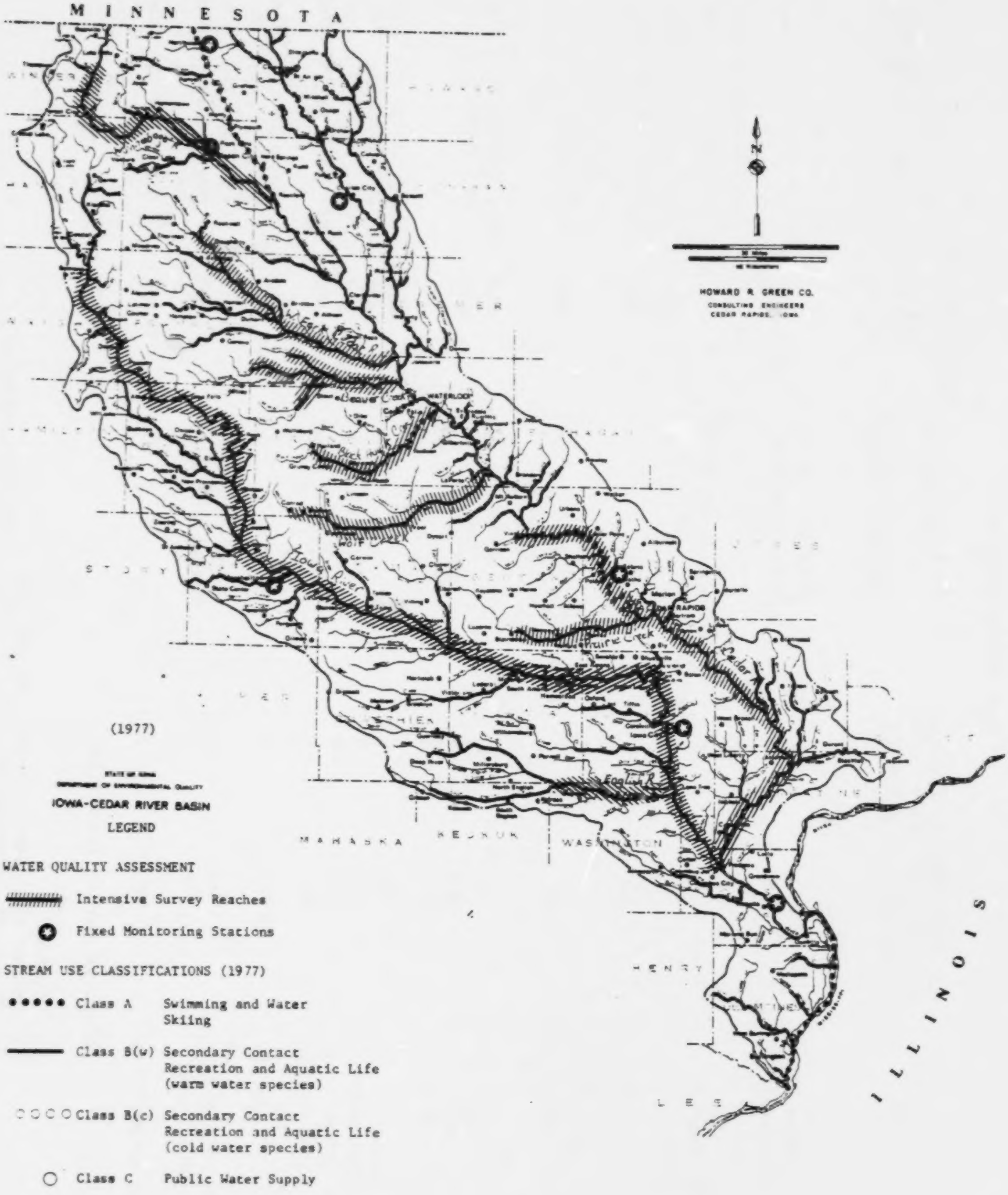
# ON

# IOWA SURFACE WATER QUALITY

# 1978

## IOWA-CEDAR RIVER BASINS

Iowa Department of Environmental Quality
Chemicals and Water Quality Division


MINNESOTA
HOWARD
MER
HAMILTON
STORY
JONES
MAHASKA
KEOKUK
WASHINGTON
HENRY
LEE
ILLINOIS
W. Fork Cedar R.
Beaver Creek
WATERLOO
Black Hawk
Wolf
Iowa River
RAPIDS
Cedar
English R.
N
HOWARD R. GREEN CO.
CONSULTING ENGINEERS
CEDAR RAPIDS, IOWA
(1977)
STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY
IOWA-CEDAR RIVER BASIN
LEGEND
WATER QUALITY ASSESSMENT
▨ Intensive Survey Reaches
✪ Fixed Monitoring Stations
STREAM USE CLASSIFICATIONS (1977)
●●●●● Class A Swimming and Water Skiing
—— Class B(w) Secondary Contact Recreation and Aquatic Life (warm water species)
○○○○ Class B(c) Secondary Contact Recreation and Aquatic Life (cold water species)
○ Class C Public Water Supply

# Iowa-Cedar River Basin
## Data Needs Summary

| | Intensive Surveys | | Fixed Stations | | | | |
|---|---|---|---|---|---|---|---|
| | Current Data Available | Data Needs Priority | Existing | | Recommended Additions/Relocations/Deletions | | |
| | | | Location | Value | | Location | Priority |
| Iowa River | | | | | | | |
| below the Cedar R. | No | 2 | Wapello | Good | | | |
| Cedar R. to Coralville Reservoir | Yes | 2 | Iowa City | Fair | | | |
| English River | Yes | 2 | | | add | at Riverside | Med |
| Coralville Res. to Iowa Falls | Yes | 2 | Marshalltown | Good | add | nr. Amana | High |
| Bear Creek | No | 3 | | | add | nr. Mouth | Low |
| Iowa Falls to E & W Fork | Yes | 4 | | | add | nr. Belmond | Med. |
| East Fork Iowa River | No | 3 | | | | | |
| West Fork Iowa River | No | 3 | | | | | |
| South Fork Iowa River | No | 3 | | | add | nr. Mouth | Low |
| Cedar River | | | | | | | |
| Iowa R. to Cedar Rapids | Yes | 5 | | | add | nr. Conesville | High |
| Prairie Creek | Yes | 5 | | | add | nr. Mouth | Med |
| Cedar Rapids to W.F. Cedar | No | 3 | Palo | Good | | | |
| Wolf Creek | Yes | 4 | | | add | nr. Mouth | Low |
| Black Hawk Creek | Yes | 5 | | | add | nr. Mouth | Med |
| Beaver Creek | Yes | 4 | | | add | nr. Mouth | Low |
| W. Fork Cedar to Minnesota | No | 1 | Charles City | Good | add | nr. Janesville | High |
| West Fork Cedar R. | Yes | 2 | | | add | above the Shell Rock | High |
| Winnebago River | Yes | 5 | Mason City | Good | relocate | at USGS site | Low |
| Shell Rock River | --- | 1 | Northwood | Good | add | nr. Marble Rock | High |
| Little Cedar River | No | 3 | | | add | nr. Mouth | Low |

Intensive Survey Priorities

1. Urgent
2. Needed to assess a suspected problem
3. No recent information, but no unusual problems suspected
4. Recent data available, but current trend information desirable
5. Can be deferred until after point source upgrading

## Iowa - Cedar River Basin
## Water Quality Summary

| | WQ Class. (Water Use) | WQ Problems | Expected to Meet WQ Goals - Point Source Treatment Needs | Nonpoint Source Control Needs |
|---|---|---|---|---|
| Iowa River | | | | |
| Below the Cedar R. | B(W) | 3,5,6,7 | BPT | 2 |
| Cedar R. to Coralville Res. | A,B(W),C | 3,5,6,7 | BPT | 2 |
| English River | B(W) | 3,5,6,7 | BPT & AWWT | 2-3 |
| Coralville Res. to Iowa Falls | A,B(W) | 1,2,3,5,6,7,8 | BPT & AWWT | 2-3 |
| Bear Creek | B(W) | NCD | | N/A |
| Iowa Falls to E & W Fork | A,B(W) | 3,5,6,7 | BPT | 2-3 |
| East Fork Iowa River | B(W) | NCD | | N/A |
| West Fork Iowa River | B(W) | NCD | | N/A |
| South Fork Iowa River | B(W) | NCD | | N/A |
| Cedar River | | | | |
| Iowa R. to Cedar Rapids | A,B(W) | 1,2,3,5,7 | BPT & AWWT | N/A |
| Prairie Creek | B(W) | 1,2,3,5,7 | BPT | N/A |
| Cedar Rapids to W. Fk. Cedar | A,B(W),C | 2,3,5,7 | BPT & AWWT | N/A |
| Wolf Creek | B(W) | 6,7 | BPT | 2 |
| Black Hawk Creek | A,B(W) | 1,2,3,5,7 | AWWT | N/A |
| Beaver Creek | B(W) | 5,7 | BPT | N/A |
| W. Fk. Cedar to Minnesota | A,B(W) | 3,7,8 | BPT | N/A |
| West Fork Cedar River | B(W) | 5 | AWWT | N/A |
| Winnebago River | B(W) | 3 | AWWT | 3 |
| Shell Rock River | A,B(W) | Reserved | BPT | N/A |
| Little Cedar River | B(W) | NCD | | N/A |

WQ Classification (Water Use): A, Swimming and Water Skiing; B, Aquatic Life and Secondary Contact Recreation; (W) Warm Water Aquatic Species; C, Public Water Supply.

WQ Problems: 1, Dissolved Oxygen; 2, Ammonia; 3, Nutrients; 4, Salinity, Alkalinity, Acidity; 5, Fecal Coliform, Point Source; 6, Fecal Coliform, Nonpoint Source; 7, Turbidity, Suspended Solids; 8, Toxic Substances; 9, Temperature; NCD, No Current Data.

Point Source Treatment Needs: BPT, Best Practicable Control Technology; AWWT, Advanced Wastewater Treatment - treatment beyond standard secondary.

Scale of Nonpoint Source Control Needs: 1, Major; 2, Extensive; 3, Minor; NA, Not Known.

## IOWA RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Suspended solids and turbidity, increasing upstream to down | Nutrients abundant | Below critical levels | Low flow sags above Coralville Reservoir | Fecal coliform violations below major discharges |

Fixed Quarterly Monitoring Stations 1975-1976

Above Marshalltown

Elevated values: turbidity (130 JTU), suspended solids (390 mg/l), nitrate (6.4 mg/l), soluble phosphate (0.33 mg/l), total phosphate (0.64 mg/l). Fecal coliform was generally low. D.O. was moderately depressed (71-78% saturation) winter, and supersaturated (121-204%) summer. Barium, chromium, copper, lead, and zinc were detected, but below standards limits.

At Iowa City

Elevated values: suspended solids (456 mg/l), fecal coliform (2,400/100 ml), turbidity (190 JTU), organic nitrogen (5.0 mg/l), nitrate (6.2 mg/l), total phosphate (0.65 mg/l), copper (70 ug/l). BOD and ammonia were generally low. D.O. was near saturation (71-103%). Barium, chromium, lead, and zinc were detected, but below standards limits.

Near Wapello

Elevated values: fecal coliform (7,000/100 ml), suspended solids (988 mg/l), turbidity (420 JTU), organic nitrogen (4.4 mg/l), nitrate (7.1 mg/l), soluble phosphate (0.39 mg/l), total phosphate (1.0 mg/l). BOD was low. D.O. was depressed (43-97% saturation) winter, and near saturation (98-112%) summer. Barium, chromium, copper, lead, and zinc were detected, but below standards limits.

Intensive Surveys

January 1976 - moderately low stream flow, (4-7) x 7 day $Q_{10}$
Reach - headwaters to Tama.
The survey was conducted during a period of cold air temperature and ice cover, and nonpoint source contribution was apparently not a factor. Turbidities were quite low, as were fecal coliform counts upstream from the major discharges. Downstream from discharges, however, point source effects were easily recognized in the data, although there was not severe degradation at this moderately low stream flow. Fecal coliform was the most significant of the contaminants, showing up as moderate increases below Belmond and Iowa Falls and violation of standards below Eldora and Marshalltown. Concentrations of dissolved materials were quite consistent throughout the survey reach, indicating that there was sufficient dilution available to readily assimilate the wastes. Biochemical oxygen demand levels were very low, so despite the ice cover, dissolved oxygen was not being depressed. Maintenance of the D.O. was helped in part by the low water temperature which inhibits natural biological processes, and this cold water effect was also seen in the ammonia-nitrogen observations. Increases in ammonia concentrations, from low background levels to the 1 mg/l range, were noted below Iowa Falls and Marshalltown, and being temperature sensitive, the resultant low rate of instream nitrification caused the elevated ammonia concentrations to persist for long distances downstream.

South Fork Iowa River, Honey Creek, Minerva Creek, Linn Creek, and Timber Creek were sampled at one station each, and found to have generally good water quality. A high fecal coliform count was noted in the Linn Creek sample, and since Linn Creek flows through the Marshalltown urban area, it must be suspected that some source of domestic waste is finding its way to the stream.

September 1976 - low stream flow, (2-3) x 7 day $Q_{10}$.
Reach - Iowa Falls to confluence with the Cedar River.
The survey found warm weather and open water, and was conducted during a non-runoff period. The water quality was, for the most part, good. Suspended solids and phosphate increases were noted below Marshalltown and Iowa City, and there was a fecal coliform violation below Iowa City, but aside from those, the point sources appeared to be having only minimal impact (fecal coliform was not tested in the reach above Iowa City). The instream biological processes were apparently active. Where moderate increases in ammonia-nitrogen were found below discharges, prompt instream nitrification resulted in very low background concentrations at the next downstream station. Minor dissolved oxygen sags were found below several of the discharges but D.O.'s were mostly high.

The English River was sampled at two locations and found to have good water quality, similar to that of the Iowa River station near the confluence of the two streams.

January 1977 - extremely low stream flow (1/5-1/2) x 7 day $Q_{10}$.
Reach - Marshalltown to the Cedar River.
This survey was conducted during a period of extended sub-zero temperature weather, heavy ice cover, and drought stream flow. As would be expected, nonpoint source contribution was not a factor, but point source impacts were pronounced and water quality was indeed poor. The reach from Marshalltown to the Coralville Reservoir was the most seriously degraded, but poor water quality was also found at the station above Marshalltown. The ammonia-nitrogen concentration (3.7 mg/l) was in violation of the water quality standard above Marshalltown, probably because of discharges at Eldora and Iowa Falls, and the dissolved oxygen (5.5 mg/l) barely met the standard. Below Marshalltown, however, ammonia increased to 8.2 mg/l and could recover to only 2.3 mg/l before entering the Coralville Reservoir. D.O. sagged to 1.9 mg/l in the reach and recovered to only 2.4 mg/l. Fecal coliform levels were also high. The reservoir appeared to be a stabilizing influence, however. Water quality below the dam was much improved. It again degraded below the Iowa City and Coralville discharges, as evidenced by increases in ammonia and fecal coliform levels, but dissolved oxygen stayed at a satisfactory level throughout the remainder of the survey reach to the Cedar.

Linn Creek in Marshalltown and Clear Creek near Iowa City were sampled and an attempt was made to sample Timber Creek. As testimony to the severe conditions, Timber Creek was frozen to the bottom and a sample could not be found. Clear Creek quality was good. Linn Creek was found to have elevated ammonia and BOD concentrations, again indicating the probability of some source of organic waste contribution.

## Conclusion

The Iowa receives a host of point source discharges, several of which are of major proportions. The data indicate that it has good assimilative capacity and good warm weather recovery capability, so that at relatively low flow it can maintain acceptable quality. However, the point sources do produce an adverse impact, and at critical weather and stream flow conditions, cause severely degraded water quality. The intensive surveys did not provide nonpoint source information, but the fixed station monitoring suggests significant nonpoint water quality impact in the lower part of the river, but probably less problem in the upper part.

## Forecast

Upgrading of treatment for the major discharges should result in significant improvement in water quality and provide for maintenance of fishable-swimmable criteria at all but the most difficult of stream flow and weather conditions. Nonpoint source affects have not been adequately assessed, but it is likely that there are significant needs for controls, particularly in the lower reaches.

## Data Needs

### Fixed Station Monitoring

The Wapello and Iowa City stations are strategically sited, in that Wapello monitors the combined Iowa-Cedar basin and Iowa City monitors the lower end of the Iowa basin and is convenient to the monitoring laboratory. Because of the influence of the Coralville reservoir on water quality, however, the Iowa City data are not representative of water quality above the reservoir, so there should be an intermediate station below Marshalltown, perhaps at Amana. It would also be desirable to add a station above the major discharges, perhaps near Belmond, to monitor background water quality, and to install a station to monitor the English River, perhaps at Riverside.

### Intensive Surveys

The Iowa is a major stream with a good many discharges and should be surveyed as often as resources permit.

## IOWA RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Before | After | Construction |
| | **1974** | | |
| Clutier | NPETP | 87 | $ 86,000 |
| Garner | 458 | 329 | 501,300 |
| Morning Sun | NPETP | 10 | 226,700 |
| Williams | 141 | 80 | 161,500 |
| | **1975** | | |
| Amana S.D. | NPETP | 150 | 388,500 |
| Coralville | 2,487 | 763 | 1,283,700 |
| Tama | 3,702 | 1,137 | 337,100 |
| Williamsburg | 628 | 141 | 361,600 |
| | **1976** | | |
| Lone Tree | 118 | 82 | 332,300 |
| Central Soya Co. @ Belmond | 284 | 95 | --- |
| | **1977** | | |
| Garwin | NPETP | 114 | 81,400 |
| Ladora | NPETP | 36 | 84,600 |
| TOTAL | 7,818 | 3,024 | $3,844,700 |

NPETP = No Prior Existing Treatment Plant.

PE = Population Equivalent - An amount or organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## TREATMENT FACILITY UPGRADE NEEDED
(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Belle Plaine | 559 | 258 | 1,830,000 |
| Belmond | 402 | 240 | 1,160,000 |
| Eldora | 3,376 | 900 | 757,000 |
| Farmland Foods Inc. @ Iowa Falls | 2,021 | 432 | ----- |
| Iowa City | 8,391 | 5,208 | 27,318,000 |
| Iowa Falls | 1,206 | 618 | 2,625,000 |
| Marshalltown | 4,698 | 2,610 | 3,666,000 |
| Packaging Corp. of America @ Tama | * | * | ----- |
| Rath Packing @ Columbus Jct. | 1,270 | 654 | ----- |
| State Center | 410 | 312 | 608,000 |
| Tama | 1,137 | 533 | 299,000 |
| Tama Meat Packing Corp. @ Tama | 17,556 | 864 | ----- |
| TOTAL | 41,026 | 12,629 | $38,263,000 |

PE = Population Equivalent - An amount or organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

* Modification of a land application system.

## CEDAR RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Turbidity and suspended solids relatively low | Nutrients abundant | Below critical levels | Serious D.O. sags below Cedar Rapids | Fecal coliform violations at high and low flow |

Fixed Quarterly Monitoring Stations 1975 - 1976

### At Charles City

Elevated values: fecal coliform (3,400/100 ml), nitrate (5.5 mg/1), soluble phosphate (3.1 mg/1). Ammonia, BOD, suspended solids, COD and turbidity were low. D.O. was near saturation (82-90%) winter and supersaturated (103-108%) summer. Barium, copper and zinc were detected, but below standards limits.

### At Cedar Falls

Elevated values: turbidity (140 JTU), suspended solids (160 mg/1), COD (67 mg/1), nitrate (18 mg/1), soluble phosphate (0.33 mg/1). Ammonia and BOD were generally low. D.O. was depressed (67-92% saturation) winter and near saturation to supersaturated (94-167%) summer. Barium, copper, lead and zinc were detected, but below standards limits.

### Near Palo (above Cedar Rapids)

Elevated values: turbidity (250 JTU), suspended solids (540 mg/1), fecal coliform (9,150/100 ml), COD (100 mg/1), nitrate (7.5 mg/1), soluble phosphate (0.55 mg/1), organic nitrogen (5.2 mg/1). BOD was low. D.O. was depressed (48-90% saturation) winter and supersaturated (123%) summer. Barium, chromium, copper, lead and zinc were detected, but below standards limits.

## Intensive Surveys

Cedar River - Vinton to confluence with the Iowa River.

September 1976 - low stream flow, (1.8) x 7 day $Q_{10}$

This was the first of a two part survey to document the effect of the Cedar Rapids point source discharges at low stream flow under both summer and winter conditions. In both cases, the water quality was found to be poor. This warm weather segment of the survey found extensive fecal coliform contamination. The counts below Cedar Rapids were very high (510,000/100 ml, maximum) but decreased uniformly to 890/100 ml near the halfway point to the Iowa River. The fecal coliform counts were also high above Cedar Rapids, which in light of the fixed station monitoring is unusual, but probably attributable to upstream discharges. The ammonia-nitrogen levels were rather low, and even below the Cedar Rapids plants did not exceed 1.8 mg/l. During warm weather, the ammonia nitrifies readily to nitrate, so the ammonia was probably being well treated to low levels in the treatment plant and being further lowered by natural processes in the river. The daytime dissolved oxygen concentrations were near the saturation point throughout the reach, except at the stations immediately below the treatment plants where it sagged to 3.6 mg/l. The low levels recovered rapidly, probably because of algal photosynthesis. However, additional D.O. samples were taken near dawn and showed an entirely different picture. During the dark hours, algal photosynthesis is replaced by respiration, which can greatly reduce the dissolved oxygen concentration. The dawn samples found a D.O. of 9 mg/l above Cedar Rapids, but a drop to 0.3 mg/l below the treatment plants, and recovery to only 3.3 mg/l fifteen miles downstream.

Prairie Creek was sampled near its mouth and was found to have marginally acceptable water quality. Dissolved oxygen was depressed but meeting the standard, while fecal coliform violated the standard and suspended solids and turbidity were high. The other water quality indicators were at adequate concentrations.

Cedar River - Vinton to confluence with the Iowa River.

January 1977 - very low stream flow, (1) x 7 day $Q_{10}$

This cold weather segment of the survey again found poor water quality, but conditions were significantly different. The stream flow rate was only half of that found during the September survey and there was thick ice cover over most of the reach. There were again large fecal coliform increases at stations immediately below Cedar Rapids, but the counts above Cedar Rapids were low in comparison to the summer survey, and died to lower levels within a much shorter distance below Cedar Rapids. These organisms survive for less time in $0^\circ$ C water temperatures. The temperature also affected the ammonia-nitrogen and dissolved oxygen concentrations. Ammonia increased from a background of 1.0 mg/l above to 8.1 mg/l below the discharges, and persisted at high levels (5.8 mg/l) all the way to the Iowa River, indicating that both the cold weather treatment efficiency and the rate of instream nitrification were greatly lowered. The dissolved oxygen, while only slightly depressed above Cedar Rapids, sagged to 2.3 mg/l along the reach and could recover under the ice to only 3.3 mg/l at the last downstream station.

Prairie Creek was again sampled near the mouth and found to have poor quality. The concentrations of the oxygen demand indicators (BOD and COD) were high, and ammonia-nitrogen, fecal coliform, and dissolved oxygen were in violation of the water quality standards.

## Conclusion

The Cedar in the Cedar Rapids reach is heavily point source loaded, and during these critical conditions of low stream flow, particularly during cold weather, was incapable of assimilating the wastes. In less demanding weather and hydrologic circumstances, the river is less severely contaminated, but the surveys found significant water quality degradation and point out the need for improvement in waste treatment effectiveness. The surveys were conducted during non-runoff periods so did not measure nonpoint source inputs, and the fixed station monitoring showed no pronounced nonpoint source effects, but there is insufficient data on which to make an adequate nonpoint source assessment. The surveys covered only a small portion of the river's length so should not be used to intepret the quality of the rest of the basin. It has a high sustained flow, even in the upper reaches, so is capable at most locations of assimilating point source waste loads without great adverse effect. However, contamination has been observed in the past at several locations, particularly below Charles City and Waterloo-Cedar Falls. Prairie Creek, because of its small drainage area, is more critically affected by drought flow, cold weather, and ice cover than is the Cedar, so the poor water quality found during the surveys was not unexpected. There are several small discharges to Prairie Creek, but most are from waste stabilization ponds which, if properly managed, should not be a pollution factor during low stream flows.

## Forecast

A new Cedar Rapids municipal advanced wastewater treatment plant is now under construction, and when finished, should greatly improve the Cedar River water quality. The plant is designed to produce an effluent which will allow for maintenance of water quality standards at even the most demanding of environmental conditions. Waste stabilization pond improvements are planned for Prairie Creek discharges. Expansion of pond storage capacities will allow for retention of waste during low stream flows as a measure to lessen the stress on stream water quality.

## Data Needs

### Fixed Monitoring Stations

The three existing stations are strategically sited and should remain. However, the Cedar being the state's second largest interior stream, should be more comprehensively monitored. Stations should be added near the mouth, perhaps at the USGS Conesville gaging station, and above the West Fork Cedar, perhaps near Janesville.

### Intensive Surveys

Additional monitoring work is needed in the Upper Cedar reaches, and the basin should be resurveyed as often as resources permit.

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | | Discharge P.E. After | Construction Cost |
|---|---|---|---|---|
| | | 1974 | | |
| | | NONE | | |
| | | 1975 | | |
| Gilbertville | NPETP | | 23 | $ 458,900 |
| | | 1976 | | |
| Osage | 983 | | 287 | 361,600 |
| | | 1977 | | |
| Nichols | NPETP | | 78 | 96,100 |
| Jesup | 414 | | 162 | 332,600 |
| Plainfield | ___ | | ___ | 112,900 |
| TOTAL | 1,397 | | 550 | $1,362,100 |

## TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Cedar Rapids | 126,018[A] | 59,334[B] | 69,150,700 |
| Charles City | 5,274 | 2,736 | 5,200,000 |
| Deere & Co. @ Waterloo | C | C | --- |
| Mt. Vernon | 459 | 459 | 365,000 |
| Vinton | 2,842 | 1,758 | 3,000,000 |
| Waterloo | 18,075 | 10,866 | 18,811,000 |
| Waverly | 1,056 | 1,002 | 1,840,000 |
| West Liberty | 1,978 | 664 | 2,884,700 |
| TOTAL | 155,702 | 76,719 | $101,251,400 |

NPETP = No Prior Existing Treatment Plant.
PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.
A = Total for Main and Indian Creek Plants.
B = New plant to replace existing main and Indian Creek Plants.
C = Project to reduce the concentration of toxic and other industrial waste substances.

## WOLF CREEK

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High nonpoint turbidity and suspended solids | Low nutrients, except during runoff | No problems observed | Oxygen Demand impacts minimal | Nonpoint constituents only |

Fixed Monitoring Stations

None

Intensive Surveys

June, 1975

This survey caught a runoff event and provided some interesting data on the effects of nonpoint source inputs. The sampling was conducted in a one day period following a 1.5 to 2.0 inch rainfall over the basin, most of which had occurred in the early morning of the survey date. It was found that the levels of turbidity and suspended solids and the other substances associated with runoff correlated with the volume of flow in the stream and the relative rise and fall caused by the runoff. At the mouth, the flow rate was high indicating that the runoff was coming down, but the peak flow rate was found at Traer, near the mid-point of the survey reach. In the Gladbrook-Conrad area at the upper end of the survey reach, the peak flow rate had gone by. The turbidity and suspended solids levels followed the flow rate trend - high at the mouth, but maximum at Traer, and sharply down at the upper end of the reach. The maximum turbidity, found at the Traer station, was 2,800 JTU compared to 95 JTU at the upstream station. The relative levels of suspended solids, from upstream to downstream, followed an almost identically shaped curve to that for turbidity. Close upstream to downstream correlations with turbidity and suspended solids were also found for chemical oxygen demand, organic and ammonia nitrogen, total phosphate, and fecal coliform. A peak in heavy metals concentrations was also found at the Traer station, while at the upstream end, the heavy metals concentrations were very low. Minimum to maximum ranges for some of the other constituents were fecal coliform 7500-266,000/100 ml, suspended solids 396-6,400 mg/l, COD 22-560 mg/l, organic nitrogen 2.2-21 mg/l, and total phosphate 0.38-5.2 mg/l. Dissolved oxygen stayed at satisfactorily high concentrations the entire length of the stream.

September, 1976

The stream was again sampled in September during a dry period, and the water quality was good. Runoff was not a factor and no pronounced adverse effects from point sources were observed. The levels of phosphate and nitrogen nutrients were low. The biochemical oxygen demand and ammonia-nitrogen concentrations, which are indicators of organic waste inputs, were at low levels. The levels of phosphate and other nitrogen nutrients were also low, and fecal coliform counts were at acceptable levels. Suspended solids concentrations were relatively high, probably indicative of the presence of large algal populations rather than a measurement of waste inputs, and the dissolved oxygen concentration was above the saturation level.

## Conclusion

In between extremes of low drought flow and heavy runoff, Wolf Creek is capable of good water quality, and is probably typical of a great many similar size streams. At extreme low flow, there is little if any dilution available near the headwaters, so that upstream dischargers must practice advanced wastewater treatment in order to meet standards. Lower in the basin, point source effects are minimal. When runoff occurs, however, nonpoint source inputs have a significant adverse effect on water quality. The data indicate that these observable effects are short lived, and the stream returns to acceptable quality as soon as the runoff recedes. Nevertheless, there may be long term effects, in that such constituents as pesticides and heavy metals are deposited in the bottom silts and can persist for long periods.

## Forecast

During non-runoff conditions, water quality standards are being met throughout most of Wolf Creek. In order to meet cold weather and low stream flow requirements, dischargers near the headwaters must practice advanced waste treatment if water quality standards are to be met throughout the stream. Profound adverse nonpoint source effects have been documented, however, and will be more difficult to correct.

## Data Needs

### Intensive Surveys

The surveys did not point out any unusual or unexpected problems, so future surveys would have low priority.

### Fixed Monitoring Stations

Consideration should be given in the statewide water quality monitoring strategy, to installation of a trend monitoring station near the mouth. However, it would have a low to medium priority.

# WOLF CREEK

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E.<br>Before | After | Construction Cost |
|---|---|---|---|
| | **1974, 1975, 1976** | | |
| | NONE | | |
| | **1977** | | |
| Beaman | NPETP | 50 | $ 152,200 |

## TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

No majors with needs

NPETP = No Prior Existing Treatment Plant

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## BLACK HAWK CREEK

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| No unusual problems | Nutrients abundant | Below critical levels | Cold weather D.O. sags not uncommon | Point source fecal coliform throughout |

Fixed Monitoring Stations

None

Intensive Surveys

September 1976 - moderately low stream flow, (5) x 7 day $Q_{10}$

The survey found rather poor water quality throughout the length of the stream, particularly in the reach below the discharge at Hudson. There are several significantly large discharges to the stream and the data show at least some degradation of water quality resulting from three of them. Above Hudson, the principal contaminant was fecal coliform, which exceeded the water quality standards limitations below Grundy Center and at the stations above and immediately below Reinbeck. Significant increases in suspended solids were also noted below Grundy Center and Reinbeck. Soluble and total phosphate levels were high throughout the reach, but were also high above Grundy Center, so the discharges are not the sole cause. The ammonia-nitrogen and oxygen demand indicators (BOD and COD) were at low concentrations in the reach above Hudson, and the dissolved oxygen concentrations were satisfactory. The most pronounced degradation, however, was found in the reach from Hudson to the Cedar River. Fecal coliform and ammonia-nitrogen levels increased to standards violations (230,000/100 ml and 2.3 mg/l respectively), there were significant increases in organic-nitrogen, phosphate, BOD and suspended solids levels, and sludge deposits were observed in the stream.

## Conclusion

The stream has had chronic water quality problems throughout the years, directly attributable to point source discharges. Some treatment improvements have been made, but the survey shows that more work is needed. The sampling was conducted during open water, temperature, and stream flow conditions favorable to good water quality. In a more demanding weather and hydrologic situation, a finding of more severely degraded water quality would have been likely.

## Forecast

Subsequent to the survey, the municipal waste treatment facility at Reinbeck has achieved a high level of advanced treatment, which should relieve some of the stress on water quality in the reach below. However, upgrading is also needed at Grundy Center and Hudson, which water quality modeling studies have shown will permit attainment of standards at drought stream flows. Black Hawk Creek can be a valuable recreational stream. It has been made the center of a green belt through a portion of the Waterloo area, and is deserving of a high level of water quality management.

## Data Needs

### Fixed Monitoring Stations

Installation of a fixed station near the mouth of Black Hawk Creek would be desirable. The stream encompasses a rather large drainage area, and information is needed on both nonpoint source effects and point source related water quality trends.

### Intensive Surveys

Low flow water quality is well enough documented that further surveys could await the completion of planned treatment plant improvements at Hudson and Grundy Center. A runoff affected survey in the meantime, however, would be of value.

## BLACK HAWK CREEK

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E.<br>Before | After | Construction Cost |
|---|---|---|---|
| | **1974, 1975, 1976** | | |
| | NONE | | |
| | **1977** | | |
| Reinbeck | 1,127 | 109 | $ 369,500 |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E.<br>Current | Required | Projected Cost Construction |
|---|---|---|---|
| Grundy Center | 888 | 234 | $ 3,332,000 |
| Hudson | 712 | 426 | 1,239,200 |
| TOTAL | 1600 | 660 | $ 4,571,200 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## BEAVER CREEK

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| No pronounced impacts observed | No apparent problems. | Below critical levels | Oxygen Demanding loads minimal | None detected |

Fixed Quarterly Monitoring Stations

None

Intensive Surveys

September 1975 - moderately low stream flow, (4) x 7 day $Q_{10}$

This survey covered nearly the entire length of the mainstem Beaver Creek and included samples from several of the tributaries. The chemical and bacteriological data indicate good water quality throughout the basin. The survey was conducted during a non-runoff period, so nonpoint source inputs were not a factor. Suspended solids concentrations and turbidities were low. There are several point source discharges in the basin, but they were apparently having no pronounced adverse affect. The concentrations of the oxygen demand indicators were low, and the phosphorus and nitrogen nutrient concentrations were for the most part also at low levels. Moderate fecal coliform increases were found below the Aplington and Ackley area discharges and several of the indicators of organic waste were at elevated but not severely degraded concentrations at the station below Ackley. The receiving stream at Ackley is the Middle Fork of South Beaver Creek, which is an unclassified tributary with little dilutional capacity. Downstream, at the point where the Middle Fork enters the classified segment of Beaver Creek, the elevated values had recovered to acceptable levels. Dissolved oxygen concentrations were at supersaturated levels in the daytime samples. Several before dawn samples taken to determine the extent of dark hours depletion, were found to be in the 9.5-9.7 mg/l range which was somewhat lower than the daylight highs, but quite acceptable for maintenance of aquatic life. Heavy metals samples were taken, but none of the eight metals analyzed for were detected.

## Conclusion

The data show that the water quality of the Beaver Creek basin is good. At lower stream flows there may be more apparent point source effects, but modeling studies indicate that secondary treatment levels for the existing discharges will maintain water quality standards. The survey provided no information on nonpoint source related quality.

## Forecast

Fishable-swimmable criteria are now being met and continued careful waste treatment plant operation and maintenance should allow for high quality water in the future. Additional assessment will be needed in order to forecast nonpoint source related quality.

## Data Needs

### Intensive Surveys

A runoff affected survey is needed to assess nonpoint source inputs. Further low flow surveys, however, will have low priority unless future discharge monitoring suggests the existance of water quality problems.

### Fixed Station Monitoring

A water quality trend measurement station near the mouth of the main stem would be desirable. Within the scope of statewide needs, however, it would have low priority.

### Treatment Plant Upgrading

None of the discharges within the basin are classified as "majors".

# WEST FORK CEDAR RIVER
## Above the Shell Rock River

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Low turbidity | Moderate nutrient levels | Below critical levels | Supersaturated D.O. | No serious problems |

Fixed Quarterly Monitoring Stations

None

Intensive Surveys

June, 1976 - moderately high stream flow, (29) x 7 day $Q_{10}$

At these flows the water quality was very good. On the mainstem of the stream, point source effects were not detectable. Biochemical oxygen demand (BOD), ammonia-nitrogen, and fecal coliform levels were low. These indicators of dissolved materials were also quite uniform from upstream to downstream. The survey was conducted during a non-runoff period so the suspended material indicators were, as would be expected, also rather low. However, turbidity increased moderately from upstream to downstream, although this may have been due to buildup of algal populations. Dissolved oxygen concentrations exceeded the saturation level. There was some diversity of quality in the nine tributary streams* sampled. Moderately elevated fecal coliform and phosphate levels were noted at one station on Maynes Creek, but since there are no known upstream discharges, the cause was unclear. There was also some fecal coliform (5000/100 ml), nitrate, and phosphate contamination in a sample from Squaw Creek, which might be attributed to the City of Hampton waste discharge. However, Squaw Creek flows into Hartgrave Creek and did not appreciably alter the Hartgrave Creek water quality. In general, the concentrations of dissolved materials were lower in the tributaries than in the mainstem.

* West Fork Cedar River Tributaries sampled as part of this survey:

Beaverdam Creek, Bailey Creek, Otter Creek, Squaw Creek, Hartgrave Creek, Maynes Creek, Dailey Creek, McClure Creek.

## Conclusion

The relatively high stream flow rate experienced during this survey makes it difficult to draw conclusions from the data on year-around long term water quality. The data show that the stream was of high quality during the survey and certainly suggest that it is so a large percentage of the time. However, no information was gained on nonpoint source effects or low flow point source impacts. Modeling studies indicate that point sources, particularly Hampton and the Clear Lake Sanitary District, can have pronounced affect at low stream flow and that some form of advanced waste treatment will be needed to protect Beaverdam Creek and Squaw/Maynes Creeks at the 7 day 10 year low flow.

## Forecast

Fishable-swimmable water quality criteria are being met for the most part, and can be consistently maintained with implementation of presently planned water quality construction projects. Nonpoint source control needs have not been adequately assessed, but are probably not as great in scope as for most other areas of the state.

## Data Needs

### Fixed Monitoring Stations

This is a good water quality stream and of large enough drainage area and flow volume to warrant fixed station surveillance for degradation. In order to most effectively monitor the basin, a station should be added at a location below Maynes Creek but above the influence of the Shell Rock River.

### Intensive Surveys

Little is known of either the low flow or runoff affected quality of the West Fork. It should be resurveyed under either or both of those conditions as early as resources permit.

## WEST FORK CEDAR RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | |
|---|---|
| None | 1974, 1975, 1976, 1977 |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Clear Lake S.D. | 2,124 | 1,074 | $5,146,500 |
| Hampton | 966 | 642 | 676,000 |
| TOTAL | 3,090 | 1,716 | $5,822,500 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## WINNEBAGO RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Suspended Solids and Turbidity Generally Low | Nutrients Relatively Abundant | Below Critical Levels | D.O. Near Saturation | Fecal Coliform Generally Low |

Fixed Quarterly Monitoring Station 1975-76

Near Mason City

Elevated values: Nitrate (8mg/l). Organic nitrogen, total and soluble phosphate, suspended solids, and COD were moderate to low. Ammonia, BOD, fecal coliform, and turbidity were generally low. D.O. was near saturation (78-91%) winter and supersaturated (128-226%) summer. Barium, lead and zinc were detected, but below standards limits.

Intensive Surveys

February 1976 - low stream flow, (3) x 7 day $Q_{10}$.

Water quality was good from top to bottom, even though the stream flow rate was relatively low and there was complete ice cover at most of the stations. In the upper reach of the stream, the fecal coliform, suspended solids, and turbidity levels were quite low, which is indicative of non-runoff conditions. Dissolved oxygen and ammonia-nitrogen were at acceptable concentrations, considering the water temperature and ice cover which inhibit natural biological processes. These generally good and slightly improving conditions extended downstream to the Mason City area. Immediately below Forest City there was some degradation in the form of increased fecal coliform count and ammonia and phosphate concentrations, but the quality improved with distance downstream. Two tributaries, Beaver Creek and Willow Creek, were also sampled and found to have similarly acceptable quality.

The most significant finding of the survey, however, was the quality of the river through and below Mason City. It can best be illustrated by comparing the results of this survey with a similar survey conducted in 1970. In 1970 there were three major discharges in the Mason City area, all contributing to severe degradation of the river. That situation has changed significantly with abandonment of the American Crystal Sugar and Armour and Co. discharges and upgrading of the Mason City municipal waste treatment plant to a high level of advanced wastewater treatment. The data show the results, and the improvement is striking. Comparison of the two surveys should be valid because both were conducted in February under similar temperature, ice cover, and low stream flow conditions. The 1976 survey found only one third of the stream flow, hence one third the dilution capacity that was available in 1970, but even so, there was pronounced improvement in nearly all of the water quality parameters. For instance:

Fecal Coliform - In 1970 flow into the Mason City area at a count of 320/100 ml, increased to 9000/100 ml, before dying to 100/100 ml far downstream near confluence with the Shell Rock - In 1976, came in at 120/100 ml, but did not exceed 820/100 ml, and died to 40/100 ml near the mouth.

Biochemical Oxygen Demand (BOD) - In 1970, came into Mason City at 1 mg/l, increased to 20 mg/l through the Mason City reach, before reducing to 3 mg/l near the mouth - In 1976, came in at 2 mg/l, did not exceed that concentration anywhere, and eventually reduced to less than 1 mg/l.

Dissolved Oxygen (D.O.) - In 1970, came into Mason City at 8.6 mg/l, steadily sagged to a low point of 2.7 mg/l, and could not recover to more then 3 mg/l before entering the Shell Rock - In 1976, came in at 12.4 mg/l, increased steadily through Mason City and throughout the entire reach to the Shell Rock.

## Conclusion

The Winnebago, with the exception of the short contaminated reach below Forest City, can now be considered a river of excellent water quality. It was not always so. Pollution below the Mason City area has been a chronic problem through the years. As a water quality monitoring historical note, the Winnebago was one of the influences prompting early water pollution control legislation. In 1925, then known as Lime Creek and considered by the State Department of Health to be the oldest and most outstanding (water quality) problem in the state, it was selected as the subject for Iowa's first official stream pollution study.[1]

## Forecast

Upon upgrading of the Forest City discharges, water quality standards should be met. Fixed station monitoring has not detected pronounced nonpoint source problems, so needs for nonpoint source controls are probably not as great as for other areas of the state. Prevention of future degradation will require careful water quality management and treatment plant operation.

## Data Needs

### Fixed Station Monitoring

The existing station is located above Mason City so does not assess the Mason City point sources. This has merit, in that it provides a good measure of background quality, but there is need for a station downstream from Mason City, as well as a monitor on the lower reach of the Shell Rock River. If a Shell Rock station is added, perhaps near Marble Rock, the relative location of the Mason City station is good. However, consideration should be given to moving it seven miles downstream to the USGS gaging station, which is in Mason City but above the municipal treatment plant.

### Intensive Surveys

A runoff affected survey would be desirable, but in view of statewide needs, would not have high priority.

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[1] "A stream Pollution Study of Lime Creek and Shell Rock River", Iowa Department of Health, 1926.

## WINNEBAGO RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | | Discharge P.E. After | Construction Cost |
|---|---|---|---|---|
| | | 1974 | | |
| Lake Mills<br>(on Beaver Cr.) | 516 | | 153 | $ 709,700 |
| | | 1975 | | |
| Mason City | 7,927 | | 1,399 | 4,019,800 |
| | | 1976 | | |
| | | 1976 and 1977 | | |
| | | NONE | | |
| TOTAL | 8,443 | | 1,552 | $ 4,729,500 |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Forest City | 588* | 348 | $ 4,767,200 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.
* Total for east and southwest plants.

# REPORT

# ON

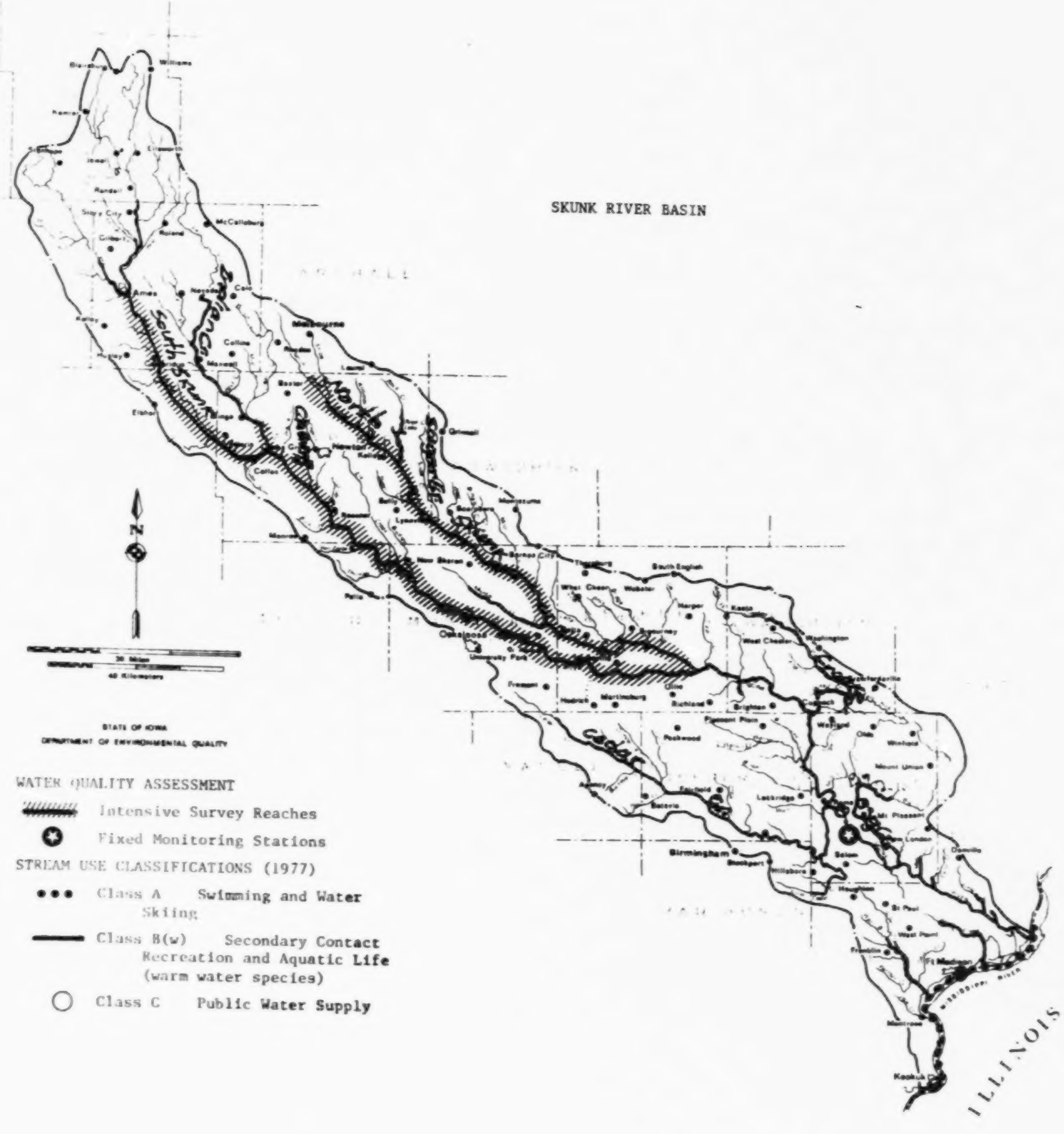
# IOWA SURFACE WATER QUALITY

# 1978

## SKUNK RIVER BASINS

Iowa Department of Environmental Quality
Chemicals and Water Quality Division

SKUNK RIVER BASIN


N
30 Miles
40 Kilometers
STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY ASSESSMENT
▨ Intensive Survey Reaches
✪ Fixed Monitoring Stations
STREAM USE CLASSIFICATIONS (1977)
••• Class A Swimming and Water Skiing
— Class B(w) Secondary Contact Recreation and Aquatic Life (warm water species)
○ Class C Public Water Supply
South Skunk
North Skunk
Cedar
Ames
Oskaloosa
Birmingham
Keokuk
Mississippi River
ILLINOIS

## Skunk River Basin
## Water Quality Summary

| | WQ Class. (Water Use) | WQ Problems | Expected to Meet WQ Goals Point Source Treatment Needs | Nonpoint Source Control Needs |
|---|---|---|---|---|
| Skunk River | | | | |
| Main Stem | B(W),C | 1,2,3,5,6,7 | BPT | 1-2 |
| Big Creek | B(W) | NCD | AWWT | N/A |
| Cedar Creek | B(W) | NCD | AWWT | N/A |
| Crooked Creek | B(W) | NCD | AWWT | N/A |
| South Skunk River | | | | |
| Fork to above Ames | B(W),C | 1,2,3,5,6,7 | AWWT | 1 |
| Cherry Creek | Min. Stds. | NCD | AWWT | N/A |
| Indian Creek | B(W) | 7 | AWWT | N/A |
| North Skunk River | | | | |
| Fork to Source | B(W) | 3,6,7 | AWWT | 1-2 |
| Sugar Creek | Min. Stds. | NCD | AWWT | N/A |

WQ Classification (Water Use): A, Swimming and Water Skiing; B, Aquatic Life and Secondary Contact Recreation; (W), Warm Water Aquatic Species; C, Public Water Supply; Min. Stds. (Minimum Standards), General Criteria Providing for Freedom from Deleterious Pollutants.

WQ Problems: 1, Dissolved Oxygen; 2, Ammonia; 3, Nutrients; 4, Salinity, Alkalinity, Acidity; 5, Fecal Coliform, Point Source; 6, Fecal Coliform, Nonpoint Source; 7, Turbidity, Suspended Solids; 8, Toxic Substances; 9, Temperature; NCD, No Current Data.

Point Source Treatment Needs: BPT, Best Practicable Control Technology; AWWT, Advanced Wastewater Treatment - treatment beyond standard secondary.

Scale of Nonpoint Source Control Needs: 1, Major; 2, Extensive; 3, Minor; NA, Not Known.

## Skunk River Basin

## Data Needs Summary

| | Intensive Surveys | | Fixed Stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | Existing | | Recommended Additions/Relocations/Deletions | | |
| | Current Data Available | Data Needs Priority | Location | Value | | Location | Priority |
| Skunk River Main Stem | No | 2 | nr. Mt. Pleasant | OK | move to | nr. Mouth | High |
| Big Creek | No | 2 | | | | | |
| Cedar Creek | No | 2 | | | | | |
| Crooked Creek | No | 2 | | | | | |
| South Skunk River Fork to Source | Yes | 5 | | | add | above Fork | High |
| Cherry Creek | No | 2 | | | | | |
| Indian Creek | Yes | 4 | | | | | |
| North Skunk River Fork to Source | Yes | 5 | | | add | above Fork | High |
| Sugar Creek | No | 2 | | | | | |

Intensive Survey Priorities

1. Urgent
2. Needed to assess suspected problem
3. No recent information, but no unusual problems suspected
4. Recent data available, but current trend information desirable
5. Can be deferred until after point source upgrading

## SKUNK RIVER

| Physical Modification | Eutrophication Potential | Salinity Alkalinity Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Turbidity and suspended solids high during runoff | High nutrient levels from point and non-point sources | Below critical levels | DO depressed winter, super saturated summer | High fecal coliform levels below major point sources |

Fixed Quarterly Monitoring Stations 1975-1976

Near Mount Pleasant

Elevated values: Organic nitrogen (5.2 mg/l), nitrate (7.5 mg/l), soluble phosphate (0.55 mg/l), fecal coliform (9,150/100 ml), suspended solids (1,969 mg/l), turbidity (660 JTU), COD (100 mg/l), barium (0.7 mg/l), copper (70 ug/l). BOD was low. DO was depressed (48% saturation) winter and supersaturated (123%) summer. Chromium, lead, and zinc were detected, but below standards limits.

Intensive Surveys

September 1976 - low stream flow, (10) x 7 day $Q_{10}$

South Skunk River

During this survey, water quality was not good. This segment of the river is characterized by the presence of several large point source discharges and can be expected, as the data showed, to be adversely affected at low flows. Above Ames the river is quite small but receives several discharges, including a combined domestic, industrial waste source at Ellsworth. Below Ames there is more dilution available, but the discharges are larger. The point source effects were clearly shown by increases in pollutant concentrations below discharges. Fecal coliform was moderately elevated below Colfax, and increased to greater than standards limits below Ames and Oskaloosa. Ammonia levels were low throughout most of the segment, but jumped to standards violations below Ames. There was a suspended solids increase below Oskaloosa, and soluble phosphate increases below both Ames and Newton. Although dissolved oxygen problems have been noted in other surveys, BOD and COD values were relatively low, and DO did not appear to be a problem in this one. One of the larger tributaries, Indian Creek, was also sampled. Its water quality was good, and its inflow tended to improve the quality of the South Skunk.

North Skunk River

This segment is not so heavily point source impacted, and the survey showed good water quality. Dissolved oxygen levels were high (afternoon values higher than morning, indicating algal activity) and oxygen demand (BOD and COD) and nitrogen and phosphorus nutrients were low. No fecal coliform samples were taken.

## Conclusions

Although these surveys did not cover the main stem below the north-south fork, previous water quality data and modeling studies have shown that adverse point source effects continue nearly the entire reach to the Mississippi. In addition to those on the South Skunk, the main stem receives major discharges from the cities of Sigourney, Fairfield, Washington, Mt. Pleasant and New London. Furthermore, the river has been shown to be significantly affected by nonpoint source pollutants. Land in the Skunk River basin, particularly the upper reaches, yields high sediment loads. This is borne out by the quarterly monitoring station data which show elevated values for suspended solids and turbidity, and the nitrogen and phosphorous nutrients.

## Forecast

Advanced waste treatment will be required in many cases, but upgrading of the discharges will permit year around attainment of the point source related water quality standards at drought flow. Extensive nonpoint source control will also be needed to improve existing water quality, but attainment of low solids nonturbid conditions is questionable.

## Data Needs

### Quarterly Monitoring Stations

One station does not adequately monitor a drainage basin of this size. A new station should be established on both the north branch and the south branch above the fork, in which case the present station could be moved downstream, nearer the Mississippi, to monitor the basinwide cumulative water quality effects.

### Intensive Surveys

Low flow and runoff affected surveys should be conducted on the main stem below the fork. Low flow surveys are also needed on some of the point source impacted tributaries where little information is presently available, i.e. Indian Creek in Story and Jasper Counties, Cherry Creek below Newton, Sugar Creek below Grinnell, Crooked Creek below Washington, Big Creek below Mt. Pleasant, and Cedar Creek below Fairfield.

## SKUNK RIVER BASIN
## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | | Construction |
|---|---|---|---|---|
| | Before | | After | Cost |
| | | 1974 | | |
| Agency | NPETP | | 28 | $184,300 |
| McCallsburg | NPETP | | 29 | 106,500 |
| Oskaloosa (N. Plant) | 2,160 | | 1,330 | 1,528,000 |
| Williams | 101 | | 84 | 161,900 |
| | | 1975 | | |
| Rhodes | NPETP | | 12 | 136,900 |
| | | 1976 | | |
| Batavia | NPETP | | 84 | 182,200 |
| Smith-Jones, Inc. @ Kellogg | * | | * | ---- |
| | | 1977 | | |
| | | NONE | | |
| TOTAL | 2,261 | | 1,567 | $2,299,800 |

## TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Ames | 11,650 | 3,280 | $15,137,000 |
| Fairfield | 980 | 800 | 1,141,000 |
| Grinnell (South) | 2,300 | 2,300 A | 6,674,000 |
| Mt. Pleasant | 1,240 | 550 | 1,430,800 |
| Nevada | 550 | 400 | 589,500 |
| New London | 330 | 160 | 255,000 |
| Newton (South) | 3,500 | 960 | 8,061,000 |
| Pella (North) | 2,490 | 0 B | 7,418,300 |
| Story City | 550 | 150 | 155,000 |
| Washington | 1,750 | 1,360 | 740,000 |
| TOTAL | 25,340 | 9,960 | $41,601,600 |

NPETP = No Prior Existing Treatment Plant

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

* = Reduction of toxic waste concentrations.

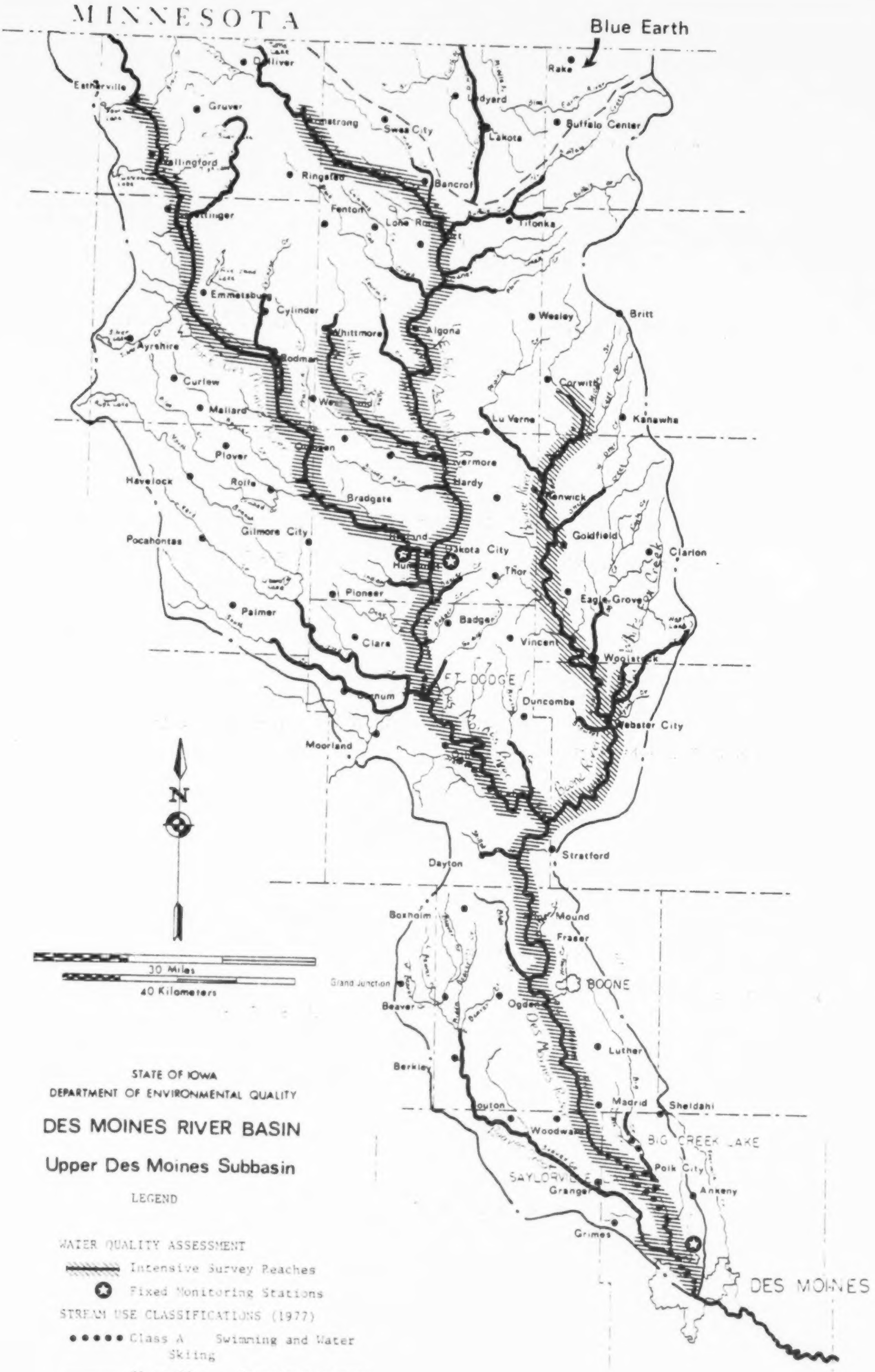
A = Reduction of ammonia concentrations.

B = Facility plan proposes discharge to the Des Moines River Basin.

# REPORT
# ON
# IOWA SURFACE WATER QUALITY
# 1978

## DES MOINES RIVER BASINS

Iowa Department of Environmental Quality
Chemicals and Water Quality Division


MINNESOTA
Blue Earth
Estherville
Dolliver
Ledyard
Rake
Gruver
Armstrong
Swea City
Lakota
Buffalo Center
Wallingford
Ringsted
Bancroft
Fenton
Lone Rock
Titonka
Graettinger
Emmetsburg
Cylinder
Whittemore
Algona
Wesley
Britt
Ayrshire
Rodman
Curlew
Mallard
West Bend
Corwith
Lu Verne
Kanawha
Ottosen
Livermore
Plover
Rolfe
Havelock
Hardy
Bradgate
Renwick
Gilmore City
Pocahontas
Goldfield
Clarion
Humboldt
Dakota City
Thor
Pioneer
Eagle Grove
Palmer
Badger
Vincent
Clare
Woolstock
FT. DODGE
Barnum
Duncombe
Webster City
Moorland
Des Moines River
Boone River
N
30 Miles
40 Kilometers
Dayton
Stratford
Boxholm
Pilot Mound
Fraser
Grand Junction
BOONE
Beaver
Ogden
Luther
Berkley
Madrid
Sheldahl
Bouton
Woodward
BIG CREEK LAKE
Polk City
SAYLORVILLE
Granger
Ankeny
Grimes
DES MOINES

STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY

## DES MOINES RIVER BASIN

### Upper Des Moines Subbasin

LEGEND

WATER QUALITY ASSESSMENT

▨ Intensive Survey Reaches

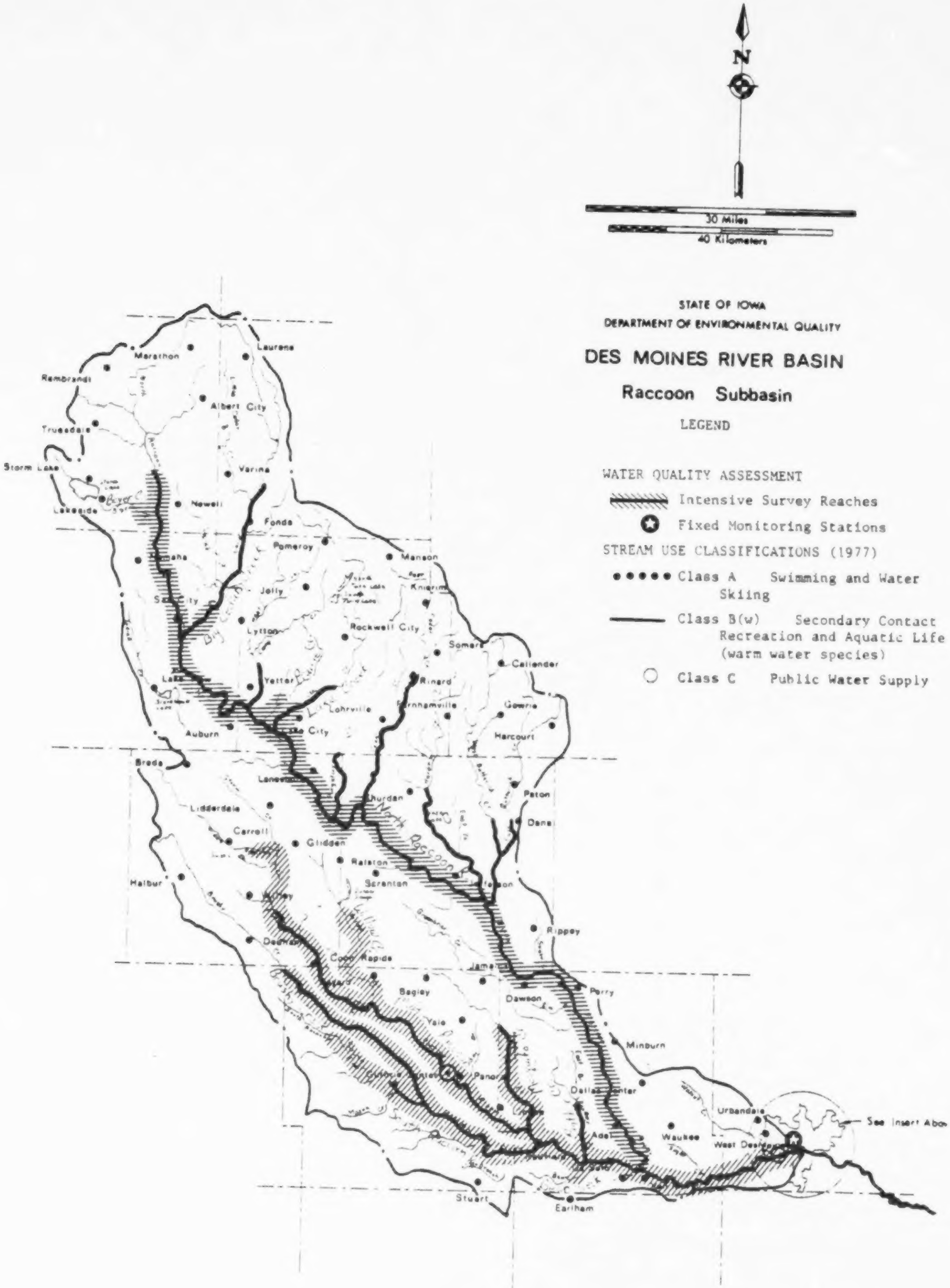
✪ Fixed Monitoring Stations

STREAM USE CLASSIFICATIONS (1977)

• • • • • Class A Swimming and Water Skiing

—— Class B(W) Secondary Contact Recreation and Aquatic Life (warm water species)

○ Class C Public Water Supply


N
30 Miles
40 Kilometers
Laurens
Marathon
Rembrandt
Albert City
Truesdale
Storm Lake
Varina
Lakeside
Newell
Fonda
Pomeroy
Manson
Knierim
Jolly
Rockwell City
Somers
Callender
Lytton
Yetter
Rinard
Lohrville
Farnhamville
Gowrie
Harcourt
Auburn
Lake City
Breda
Lanesboro
Churdan
Paton
Lidderdale
Carroll
Glidden
Dana
Ralston
Scranton
Halbur
Jefferson
Rippey
Coon Rapids
Bagley
Dawson
Perry
Yale
Minburn
Panora
Dallas Center
Urbandale
Waukee
Adel
West Des Moines
See Insert Above
Stuart
Earlham

STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY

## DES MOINES RIVER BASIN

### Raccoon Subbasin

LEGEND

WATER QUALITY ASSESSMENT

▨ Intensive Survey Reaches

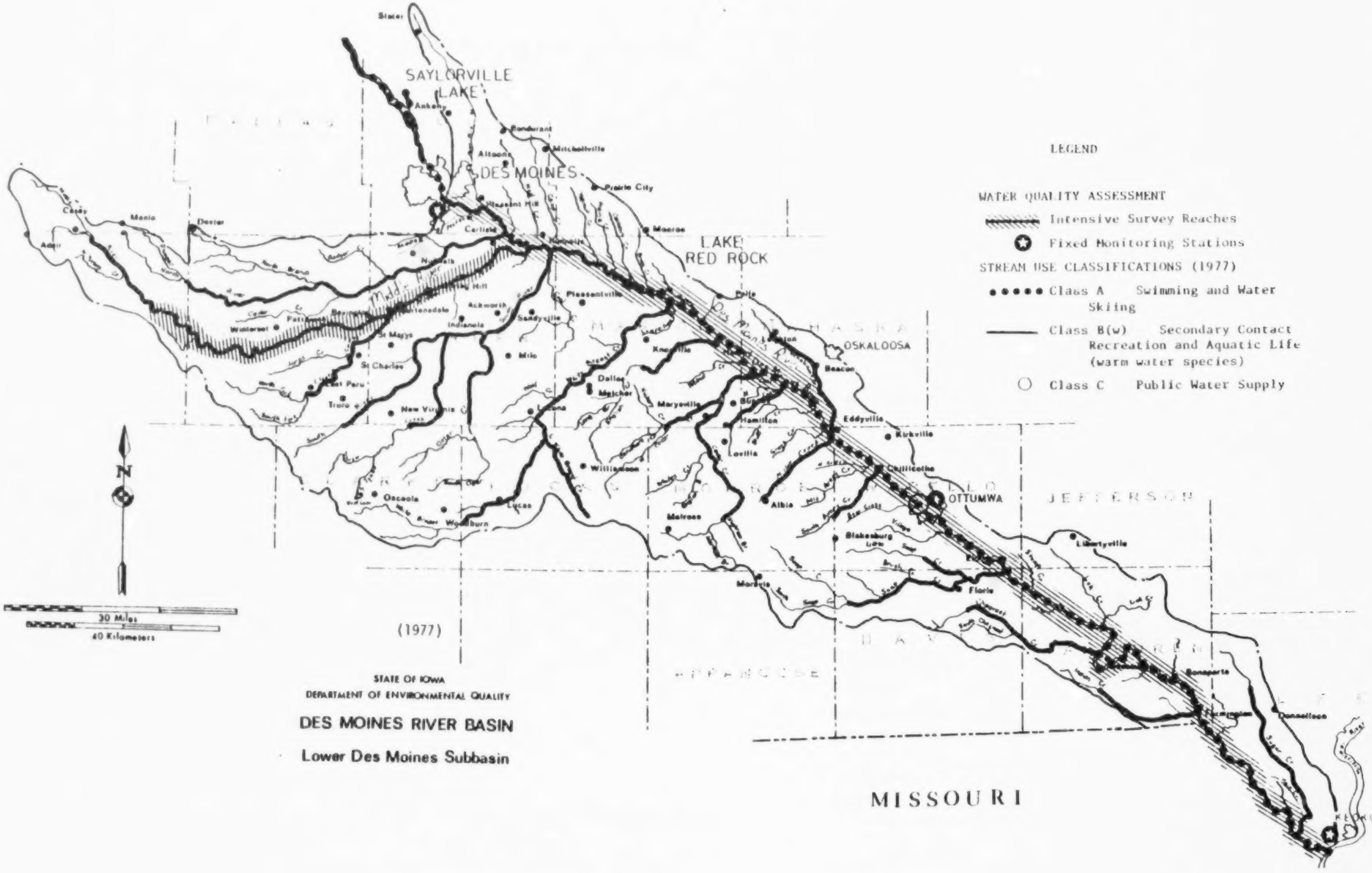
✪ Fixed Monitoring Stations

STREAM USE CLASSIFICATIONS (1977)

●●●●● Class A Swimming and Water Skiing

— Class B(w) Secondary Contact Recreation and Aquatic Life (warm water species)

○ Class C Public Water Supply



LEGEND
WATER QUALITY ASSESSMENT
Intensive Survey Reaches
Fixed Monitoring Stations
STREAM USE CLASSIFICATIONS (1977)
Class A Swimming and Water Skiing
Class B(w) Secondary Contact Recreation and Aquatic Life (warm water species)
Class C Public Water Supply
SAYLORVILLE LAKE
DES MOINES
LAKE RED ROCK
OSKALOOSA
OTTUMWA
KEOKUK
JEFFERSON
MISSOURI
N
30 Miles
40 Kilometers

(1977)

STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY

DES MOINES RIVER BASIN

Lower Des Moines Subbasin

## Des Moines River Basin
## Data Needs Summary

| | Intensive Surveys | | Fixed Stations | | | | |
|---|---|---|---|---|---|---|---|
| | Current Data Available | Data Needs Priority | Existing | | Recommended Additions/Relocations/Deletions | | |
| | | | Location | Value | | Location | Priority |
| Lower Des Moines Subbasin | | | | | | | |
| Des Moines River | | | | | | | |
| (mouth to Red Rock) | Yes | 4 | nr. Keokuk<br>at Ottumwa | good<br>good | | | |
| (Red Rock to Des Moines) | Yes | 2 | below Des Moines | good | | | |
| Whitebreast Creek | No | 2 | | | add | nr mouth | Med |
| South River | No | 3 | | | add | nr mouth | Med |
| Middle River | Yes | 5 | | | add | nr mouth | Med |
| North River | No | 3 | | | add | nr mouth | Med |
| Upper Des Moines Subbasin | | | | | | | |
| Des Moines River | Yes | 2 | above Des Moines | good | add | above Saylorville | High |
| Beaver Creek | No | 3 | | | add | nr mouth | Med |
| Boone River | Yes | 5 | | | add | nr Webster City | High |
| Lizard Creek | No | 3 | | | add | nr mouth | Low |
| West Fork Des Moines R. | Yes | 5 | at Humboldt | good | | | |
| East Fork Des Moines R. | Yes | 5 | at Dakota City | good | | | |
| Lotts Creek | Yes | 5 | | | | | |
| Raccoon River Subbasin | | | | | | | |
| Raccoon River | | | | | | | |
| Mouth to Fork of North and South | Yes | 2 | at Des Moines | good | | | |
| North Raccoon River | Yes | 5 | | | add | nr Adel | High |
| South Raccoon River | Yes | 2 | | | add | nr mouth | High |
| Middle Raccoon River | Yes | 2 | | | add | nr mouth | Med |

Intensive Survey Priorities

1. Urgent
2. Needed to assess a suspected problem
3. No recent information, but no unusual problems suspected
4. Recent data available, but current trend information desirable
5. Can be deferred until after point source upgrading

## Des Moines River Basin
## Water Quality Summary

| | WQ Class. (Water Use) | WQ Problems | Expected to Meet WQ Goals - Point Source Treatment Needs | Nonpoint Source Control Needs |
|---|---|---|---|---|
| Lower Des Moines Subbasin | | | | |
| Des Moines River | | | | |
| (mouth to Red Rock) | A,B(W),C | 3,6,7 | BPT | 2 |
| (Red Rock to Des Moines) | A,B(W),C | 1,2,3,5,6,7 | AWWT | 2 |
| Whitebreast Creek | B(W) | NCD | | |
| South River | B(W) | NCD | | |
| Middle River | B(W) | 3,6,7 | AWWT | N/A |
| North River | B(W) | NCD | | |
| Upper Des Moines Subbasin | | | | |
| Des Moines River | A,B(W) | 1,2,3,5,6,7 | AWWT | 2 |
| Beaver Creek | B(W) | NCD | | |
| Boone River | B(W) | 2,3,5 | AWWT | N/A |
| Lizard Creek | B(W) | NCD | | |
| West Fork Des Moines River | B(W) | 1,2,3,5,7 | AWWT | N/A |
| East Fork Des Moines River | B(W) | 2,3,5,7 | BPT | N/A |
| Lotts Creek | B(W) | 1,2,3,5,7 | AWWT | N/A |
| Raccoon River Subbasin | | | | |
| Raccoon River | | | | |
| mouth to Fork of North & South | B(W),C | 3,6,7 | BPT | 2 |
| North Raccoon River | B(W),C | 1,2,3,5,6,7 | AWWT & BPT | 2 |
| South Raccoon River | B(W),C | 3,6,7 | BPT | 2 |
| Middle Raccoon River | B(W) | 3,6,7 | BPT | 2 |

WQ Classification (Water Use): A, Swimming and Water Skiing; B, Aquatic Life and Secondary Contact Recreation; (W) Warm Water Aquatic Species; C, Public Water Supply.

WQ Problems: 1, Dissolved Oxygen; 2, Ammonia; 3, Nutrients; 4, Salinity, Alkalinity, Acidity; 5, Fecal Coliform, Point Source; 6, Fecal Coliform, Nonpoint Source; 7, Turbidity, Suspended Solids; 8, Toxic Substances; 9, Temperature; NCD, No Current Data.

Point Source Treatment Needs: BPT, Best Practicable Control Technology; AWWT, Advanced Wastewater Treatment -treatment beyond standard secondary.

Scale of Nonpoint Source Control Needs: 1, Major; 2, Extensive; 3, Minor; NA, Not Known.

## DES MOINES RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High suspended solids and turbidity at high flow | Nitrate and phosphate relatively abundant | Below critical levels | Significant Oxygen demanding point source loads | Frequent fecal coliform violations |

Fixed Quarterly Monitoring Stations 1975 - 1976

### Above Des Moines

Elevated values: fecal coliform (2,900/100 ml), nitrate (12 mg/l), suspended solids (210 mg/l), turbidity (170 JTU). Ammonia and COD were low to moderate. BOD was low. D.O. was moderately depressed (63-91% saturation) winter, and moderately depressed to supersaturated (71-118%) summer.

### Below Des Moines

Elevated values: fecal coliform (26,000/100 ml), suspended solids (1,019 mg/l), turbidity (325 JTU), nitrate (13 mg/l), soluble phosphate (0.76 mg/l), total phosphate (1.0 mg/l). COD and ammonia were moderate to low. BOD was low. D.O. was near saturation (89-94%) winter, moderately depressed (66-76%) spring and fall, and moderately depressed to supersaturated (79-128%) summer. Barium, copper, lead and zinc were detected, but below standards limits.

### At Ottumwa

Elevated values: fecal coliform (3,000/100 ml), nitrate (5.5 mg/l), suspended solids (420 mg/l), COD (76 mg/l), turbidity (220 JTU). Ammonia and BOD were low. D.O. was near saturation (89-109%) winter, and supersaturated (135%) summer. Barium, lead and zinc were detected, but below standards limits.

### Near Keokuk

Elevated values: fecal coliform (2,800/100 ml), suspended solids (1,500 mg/l), turbidity (880 JTU), copper (40 ug/l). Ammonia and BOD were low. D.O. varied from near saturation to supersaturation (90-114%) winter, near saturation summer, and moderately depressed (69-76%) spring. Barium, chromium, lead and zinc were detected, but below standards limits.

## Intensive Surveys

January 1974 - normal stream flow, (35-38) x 7 day $Q_{10}$
Reach - Des Moines to the East and West Fork

This was a continuation of the January 1974 survey described in the East Fork Des Moines River and West Fork Des Moines River sections. Under the favorable stream flow rate conditions found during the survey, the water quality was, in general, good. However, some degradation did show up in the data for the two sampling stations within fifteen miles below Fort Dodge. The fecal coliform count exceeded the water quality standards limitation at both stations (16,000/100 ml, and 11,000/100 ml). Further downstream it reduced to the less than 1000/100 ml range, but jumped back up to the 1300-1800/100 ml range in the reach from below Boone to above Des Moines. The Fort Dodge discharges also caused moderate increases in ammonia nitrogen and total phosphate, but the concentrations stayed within the water quality standards limitations. Dissolved oxygen was greater than 10 mg/l over the entire reach, and the other constituents of water quality were within limits normally expected under winter ice.

September 1976 - moderately low stream flow, (2-3) x 7 day $Q_{10}$
Reach - Mississippi River to the East and West Fork

This was a long distance survey covering 26 sampling stations, but with a limited number of constituents analyzed at each station. Fecal coliform was analyzed at only 2 stations above Ottumwa and dissolved oxygen was not analyzed in the reach from Des Moines through Red Rock Reservoir. Of those constituents that were covered, however, no particular problems were found. There were small decreases in water quality below the major discharges, (Fort Dodge, Boone, Des Moines) but no severe degredation was found. Biochemical oxygen demand and ammonia-nitrogen levels were low throughout the reach, but suspended solids, total phosphate, and dissolved oxygen concentrations were generally high, suggesting the presence of large algal populations contributing to maintenance of the dissolved oxygen and possible masking of the effects of the organic waste loads. The Red Rock Reservoir was apparently a stabilizing influence, as evidenced by observation of water quality improvement in the reach below the dam. Little adverse effects were observed from the Ottumwa area discharges.

## Conclusion

These particular surveys did not pinpoint any major problems, but the historical data show that the river is at times significantly impacted by point source discharges. Contamination was observed in this winter survey, even though good dilutional capacity was available, which suggests that if the stress of winter conditions is to be combined with low stream flow rates common to the basin, serious degradation could result. Past surveys have shown pollution on the reach from Fort Dodge to Des Moines and gross pollution in the reach from Des Moines through Red Rock Reservoir. Below Red Rock, however, the impact of point sources is minimal. Construction of secondary treatment facilities for the Ottumwa municipal and Hormel industrial wastewater systems was completed in the early 1970's, and water quality from Ottumwa to the Mississippi has been good. Fixed station monitoring data indicate that there are basin-wide nonpoint source effects, particularly fecal coliform, turbidity, and suspended solids, during wet weather periods.

## Forecast

Major upgrading of point source treatment effectiveness is needed in the middle and upper reaches of the basin, but completion of currently planned construction projects should permit full attainment of fishable-swimmable water quality standards at normal and low stream flow. Effective nonpoint source control is probably also needed.

## Data Needs

### Fixed Station Monitoring

The stations in the network below Saylorville Reservoir are well sited for representative monitoring of the various water quality imports in the lower Des Moines. In view of the considerable significance of Saylorville water quality however, and considering the vastness of the upstream drainage area, a station should be added to the network at a location upstream from the reservoir.

### Intensive Surveys

The Des Moines River, being the state's largest interior stream and receiving point and nonpoint source inputs from a large percentage of the state's domestic and industrial population and agricultural use acreage, deserves comprehensive monitoring and should be surveyed as often as resources permit.

## DES MOINES RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | | Construction Cost |
|---|---|---|---|---|
| | Before | | After | |
| | | 1974 | | |
| Savage S.D. | NPETP | | 50 | 128,700 |
| | | 1975 | | |
| Ankeny (East Plant) | 3,120 | | 2,150 | 2,376,800 |
| Bonaparte | NPETP | | 80 | 230,400 |
| Grimes | 2,700* | | 250* | 1,129,200 |
| | | 1976 | | |
| Barnum | NPETP | | 30 | 163,400 |
| Clare | NPETP | | 40 | 105,500 |
| Fort Dodge | 13,480 | | 3,830 | 6,364,700 |
| | | 1977 | | |
| Pilot Mount | NPETP | | 50 | 84,700 |
| TOTAL | 19,300 | | 6,480 | $10,583,400 |

## TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge P.E. | | Projected Cost Construction |
|---|---|---|---|
| | Current | Required | |
| Albia | 1,250[A] | 740 | $ 1,081,300 |
| Boone | 4,180 | 2,990 | 2,940,600 |
| Des Moines[B] | 82,400 | 37,530 | 109,486,000 |
| Farmland Industries @ Fort Dodge | 130 | 130[C] | ---- |
| Grimes | 245 | 70 | 245,200 |
| Indianola - South | 790 | 560 | 4,683,500 |
| Iowa Beef Processors @ Fort Dodge | 7,470 | 1,860 | ---- |
| Madrid | 350 | 300 | 317,000 |
| Osceola | 1,900 | 1,500 | 2,377,500 |
| Pocahontas | 470 | 350 | 360,800 |
| TOTAL | 99,185 | 46,030 | $121,491,900 |

NPEPT = No Prior Existing Treatment Plant.

* Includes Beaver Valley Canning @ Grimes.

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

A = Total for North and Southwest Plants.

B = The proposed Des Moines Plant will treat wastes from Altoona, Ankeny, Bondurant, Clive, Des Moines, Johnston, Pleasant Hill, Urbandale, West Des Moines, Windsor Heights, and some unincorporated areas of Polk, Dallas and Warren Counties.

C = Upgrade required to reduce the ammonia concentration.

# DES MOINES RIVER TRIBUTARIES
# MIDDLE RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| No problems documented | High algal populations | Below critical levels | Super saturated dissolved oxygen | None observed |

Fixed Quarterly Monitoring Stations

None

Intensive Surveys

September 1976 - moderately low stream flow, (5) x 7 day $Q_{10}$

The water quality was good. The Middle River receives a host of discharges. Two of them, the Winterset municipal wastewater treatment plant and the Indianola North treatment plant, are defined as majors. However, at this favorable stream flow rate, there were no pronounced point source affects. The oxygen demand indicators, BOD and COD, were at low concentrations, fecal coliform counts were low, and the ammonia nitrogen concentration was low. There was an increase in the suspended solids concentration immediately below Winterset, but over the rest of the stream, the suspended solids levels were low. Environmental conditions were favorable for algal growth and the resultant algal photosynthesis resulted in supersaturated dissolved oxygen levels throughout the survey reach.

Conclusion

The data from the survey show that the stream is capable of maintaining a high level of water quality under favorable stream flow and weather conditions. Water quality modeling studies have shown, however, that a high degree of BOD removal and ammonia nitrification will be required to maintain water quality standards below the Winterset and Indianola north discharges during periods of critically low stream flow, particularly during cold weather and ice cover. The headwaters reach, near Adair and Casey, is also vulnerable during critical stream flow conditions and will probably require a high degree of waste treatment to protect water uses. Nonpoint source effects have not been assessed.

## Forecast

The water quality is presently meeting fishable-swimmable criteria during favorable stream flow and weather conditions, and the good water quality should continue in the future. The critical test for water quality, however, is the low flow cold weather period which has not been measured on the Middle, but which will require a high degree of point source waste treatment to maintain water quality standards. The stream is located within the growing urban area of Des Moines, which amplifies the need for careful water quality management in the basin.

## Data Needs

### Fixed Monitoring Stations

In view of the potential for population and possible industrial growth within the drainage area, installation of a monitoring station should have high priority.

### Intensive Surveys

A low flow survey should be scheduled to more accurately assess the point source effects. A runoff affected survey is also needed.

## TREATMENT FACILITY UPGRADES COMPLETED

| | |
|---|---|
| None | 1974, 1975, 1976, 1977 |

## TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Indianola--North | 790 | 560 | $4,683,500 |
| Winterset | 450 | 220 | 358,400 |
| TOTAL | 1,240 | 780 | $5,041,900 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

NORTH RACCOON RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High suspended solids and turbidity at high flow | High nitrates | Below critical levels | D.O. violations at winter low flow | Fecal coliform violations below discharges |

Fixed Quarterly Monitoring Stations

At Des Moines

Elevated values: turbidity (120 JTU), suspended solids (210 mg/1), nitrate (13 mg/1). Ammonia, BOD and soluble phosphate were low. Fecal coliform, COD and TDS were moderate. D.O. was near saturation (80-108%) summer and depressed winter (64%).

Intensive Surveys

January 1977 - very low stream flow, (1/3) x 7 day $Q_{10}$

Water quality was poor and the survey documented the adverse affects of the point source discharges in the basin. The stream was ice covered. Dissolved oxygen was degraded at several locations, and depleted to zero from Perry to the confluence with the South Raccoon. Ammonia and phosphate were elevated throughout most of the reach, with ammonia rising to a high of 31 mg/1 below the Oscar Mayer packing plant at Perry. High fecal coliform levels were found below some of the major discharges, but dropped to moderate levels between discharges. The Oscar Mayer discharge also produced high levels of phenol (2-33 mg/1).

September 1976 - low stream flow, (2) x 7 day $Q_{10}$

At this relatively higher stream flow the water quality was better. Small D.O. depressions were noted below discharges, but the stream was under the influence of algal activity and the dissolved oxygen concentrations were, in general, good. Nitrogen concentrations were low to moderate, but phosphates were relatively high.

### Conclusion

Point source discharge problems were identified at Sac City, Jefferson, Oscar Mayer and the City of Perry. Quarterly monitoring data and past surveys suggest that nonpoint sources at high flow are also problems.

### Forecast

Considerable improvement in water quality at low winter flow is anticipated following implementation of the basin plan. The plan calls for more stringent than secondary treatment at the major discharges, which should result in attainment of fishable-swimmable criteria at normal to low flow. Meeting high quality criteria at high flow and during runoff conditions may be difficult.

### Data Needs

#### Quarterly Monitoring Stations

Data from the station at Des Moines is a good measurement of the quality flowing to the Des Moines River. However, the basin encompasses a large drainage area and one station does not adequately describe the overall water quality.

Intermediate stations should therefore be established above the South Raccoon near Adel and in the upper reach, perhaps in Greene County above Jefferson.

#### Intensive Surveys

A winter survey at low flow should be scheduled following completion of treatment upgrading at the major discharges, to determine the extent of water quality improvement.

RACCOON RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | | After | Construction Cost |
|---|---|---|---|---|
| | | 1974 | | |
| Callendar | NPETP | | 50 | $136,600 |
| | | 1975 | | |
| | | NONE | | |
| | | 1976 | | |
| Paton | NPETP | | 70 | 172,500 |
| | | 1977 | | |
| | | NONE | | |
| TOTAL | | | 120 | $309,100 |

## TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Adel | 600 | 340 | $ 147,000 |
| Jefferson | 970 | 910 | 2,119,000 |
| Lake City | 570[A] | 270 | 803,000 |
| Lake View | 350 | 340 | 160,000 |
| Oscar Meyer @ Perry | 6,240 | 1,690 | ---- |
| Perry | 1,840 | 1,580 | 2,075,000 |
| Rockwell City | 400 | 400[B] | 411,300 |
| Sac City | 540 | 420 | 701,900 |
| Storm Lake | 3,040 | 3,850[C] | 7,900,000 |
| Storm Lake Industrial Waste | 1,310 | C | ---- |
| TOTAL | 15,860 | 9,800 | $14,317,200 |

NPETP = No Prior Existing Treatment Plant

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

A = Total for North and Southwest Plants.

B = Ammonia reduction project.

C = Combined domestic and industrial waste system proposed.

MIDDLE AND SOUTH RACCOON RIVERS

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity and suspended solids at high flow | High nitrate and total phosphate at high flow | Below critical levels | Not greatly affected | Low in harmful substances |

Fixed Quarterly Monitoring Stations

None

Intensive Surveys

Middle Raccoon - April 1976 - high stream flow

This and the South Raccoon survey described below were conducted approximately 36 hours after a series of thunderstorms had crossed the basin, so the sampling reflects the effects of runoff inputs. Water quality was poor. Turbidity and suspended solids were high at the upstream end and continued to increase downstream. Nitrate was very high (up to 12 mg/l - some of the highest values reported in Iowa streams), fecal coliform was high and soluble phosphate was high. These are all indications of nonpoint source effects. At stations below Lake Panorama, however, these values decreased significantly, indicating that the reservoir has a stabilizing effect. Nevertheless, the quality was poor below the lake and degraded even further with distance downstream. Ammonia levels were low however, and D.O. was good (77%-96% of saturation). Barium, copper and zinc were detected, but were below standards levels. Water quality was examined in Willow Creek, Mosquito Creek, and tributaries of the Middle Raccoon and was found to be similar to that in the main stem.

South Raccoon - April 1976 - high stream flow, 70 x 7 day $Q_{10}$

Water quality was poor. Turbidity, suspended solids, phosphate, and fecal coliform - all indicators of nonpoint source load - were high throuhgout the reach, and tended to increase in the stream from upstream to downstream. These levels, in general, increased below Brushy Creek (which was very high in fecal coliform) but decreased below the confluence with the Middle Raccoon. Nitrate was very high throughout the reach, and increased below the junctions of both the Middle and the North Raccoon. As on the Middle Raccoon, ammonia levels were low and D.O. was near saturation. Barium, copper, chromium, lead, and zinc were detected, but below standards levels. In the South Raccoon tributaries, Bear, Brushy, and Panther Creeks, water quality was found to be similar to that in the main stem, except for the higher levels of suspended solids and fecal coliform in Brushy Creek.

## Conclusion

These surveys effectively document the adverse nonpoint source and channel erosion effects associated with high stream flows. Point source discharges did not come into play, and are of lesser significance in this portion of the basin than on the North Raccoon, even at low flow.

## Forecast

The basin is relatively lightly loaded in terms of point sources so minimal facility upgrading will be needed to maintain fishable-swimmable water quality at moderate to low flows. Solution of nonpoint sources problems may be more difficult.

## Data Needs

### Fixed Monitoring Stations

The only existing station in the Raccoon River basin is at Des Moines on the combined North and South Raccoon. Monitoring is rarely needed on the South, however and to lesser extent on the Middle. It is recommended that high priority be given to installation of at least one station above the confluence with the North Raccoon, and preferably, to one station each on the North and Middle.

### Intensive Surveys

Another survey should be scheduled during a low flow period to further assess the impact of point source discharges on the Middle and South Raccoon drainage area.

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E.<br>Before | After | Construction Cost |
|---|---|---|---|
| **1974 and 1975** | | | |
| NONE | | | |
| **1976** | | | |
| Arcadia | NPETP | 80 | $ 52,600 |

## TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E.<br>Current | Required | Projected Cost Construction |
|---|---|---|---|
| Carroll | 1,580 | 1,560 | $ 374,000 |
| Guthrie Center | 320 | 300 | 115,000 |
| TOTAL | 1,900 | 1,860 | $ 489,000 |

NPETP = No Prior Existing Treatment Plant.

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## DES MOINES RIVER TRIBUTARIES

## BOONE RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| No problems observed | Soluble Phosphate and nitrate abundant | TDS high at low flow | Good D.O. concentrations | Point source fecal coliform violations |

Fixed Quarterly Monitoring Stations

None

Intensive Surveys

September 1976 - moderately low stream flow, (3) x 7 day $Q_{10}$

The survey found open water and warm weather, and the overall water quality was good. There were no pronounced point source effects, except for an ammonia increase to 1.3 mg/l below Goldfield and a soluble phosphate increase to 0.88 mg/l below Webster City. Biochemical oxygen demand concentrations were low throughout the basin. Dissolved oxygen levels were good. The environmental conditions were conducive to good algal populations and photosynthetic activity was providing for supersaturated D.O. The only fecal coliform standard violation was found in the far upstream part of the basin above point source inputs, so was probably a result of direct livestock access. Turbidity was not measured, but suspended solids concentrations were low, and nonpoint source inputs were not a factor in the survey data.

February 1976 - moderately low stream flow, (3-4) x 7 day $Q_{10}$

In this winter survey of 1976, there was heavy ice cover, but even so, the winter quality was satisfactory. As in the September survey, point source effects were not severe, but were easily recognizable in the data. The biochemical oxygen demand concentrations were low throughout the basin and dissolved oxygen levels were satisfactory. D.O. was somewhat depressed below the Eagle Grove discharge, but stayed well above the 5.0 mg/l standard. The ammonia nitrogen concentration increased to the 2.0 mg/l water quality standard limit on the Middle Branch below Britt, and showed up as moderate increases below Eagle Grove, Clarion, and Webster City, but was generally low elsewhere in the basin. The only unusual fecal coliform counts were found on the Middle branch below Britt, and on the mainstem Boone below Webster City, where the sample showed a water quality standard violation of 30,000/100 ml. Nitrates and soluble phosphates were abundant, and moderate soluble phosphate increases were noted below Eagle Grove, Clarion, and Webster City.

## Conclusion

Although the water quality was generally good at the stream flow rates experienced during the surveys, the data show that there are point source effects and suggest that degredation during drought flows could be significant. In comparison to others in the upper Des Moines River subbasin, the individual discharges to the Boone River are not large. However, water quality modeling has shown that the combined effect of the several discharges is significant, and that a high degree of treatment at each of them will be required in order to meet water quality standards at drought stream flow. The Boone is one of the finer fishing streams in the Des Moines River Basin, and is deserving of careful water quality management and protection.

## Forecast

The Boone River basin plan calls for secondary treatment level BOD removal and a high degree of ammonia nitrification at most of the discharges. Construction of the planned treatment upgrading projects will allow for year around maintenance of water quality standards and will insure that the river will continue to be a valuable fishing and recreational resource.

## Data Needs

### Fixed Station Monitoring

Boone River water quality is of sufficient significance that installation of a monitoring station should have high priority. It is recommended that a new station be added to the network at the site of the USGS flow gauging station near Webster City.

### Intensive Surveys

There is very little water quality data on the Boone. A runoff affected survey should be conducted in order to assess nonpoint source effects, and a low flow survey should also be scheduled to further evaluate the impact of point sources.

# DES MOINES RIVER TRIBUTARIES

## BOONE RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | | Discharge P.E. After | Construction Cost |
|---|---|---|---|---|
| | | 1974 | | |
| | | NONE | | |
| | | 1975 | | |
| | | NONE | | |
| | | 1976 | | |
| Wesley | NPETP | | 90 | $ 190,900 |
| Woolstock | NPETP | | 50 | 266,800 |
| TOTAL | | | 140 | $ 457,700 |

### TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Clarion | 790 | 390 | $ 2,265,900 |
| Eagle Grove | 1,700 | 1,020 | 1,518,300 |
| Webster City | 1,980 | 1,980* | 3,154,700 |
| TOTAL | 4,470 | 3,390 | $ 6,935,900 |

NPETP = No Prior Existing Treatment Plant

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

* Upgrade required to reduce ammonia concentration of the discharge.

## EAST FORK DES MOINES RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High suspended solids and turbidity at high flow | High soluble phosphate and nitrate at high flow | Below critical levels | D.O. depressed winter, super-saturated summer | Fecal coliform violations below Algona |

Fixed Quarterly Monitoring Stations

At Dakota City

Elevated values: fecal coliform (4,400/100 ml), turbidity (130 JTU), suspended solids (230 mg/l), COD (77 mg/l), nitrate (6.0 mg/l), soluble phosphate (0.5 mg/l). Ammonia (0.01-1.4 mg/l) and BOD (2-8 mg/l) were generally low. D.O. was depressed (18-79% saturation) to 2.7 mg/l in winter but moderately supersaturated summer (113%).

Intensive Surveys

January 1974 - normal stream flow, (60-450) x 7 day $Q_{10}$

The survey found cold weather and ice cover, which are usually difficult conditions for maintenance of good water quality. However, the stream flow rate was high enough to provide good dilution, and despite the ice cover, the overall water quality was satisfactory. Dissolved oxygen concentrations were somewhat depressed, with slight decreases shown below Bancroft, Algona, and Lotts Creek, but the D.O. stayed better than the water quality standard. The ammonia-nitrogen and oxygen demand (BOD and COD) concentrations were low, indicating that the point source organic waste loads were not a significant factor. The only pronounced point source degradation was fecal coliform standards violations below Bancroft and Algona. This was a no runoff situation, and the suspended solids and turbidity levels were low, so the survey gave no insight to nonpoint source problems.

September 1976 - very low stream flow, (0.9) x 7 day $Q_{10}$

This survey found open water and relatively warm temperatures, but the stream flow rate was sharply down. Even so, the instream natural biological purification processes were active and the water quality on the Des Moines River was good. The BOD was low and dissolved oxygen was near saturation. Both ammonia and nitrate-nitrogen concentrations were low. Fecal coliform was not tested. Lotts Creek was sampled during this survey and was found to be degraded below Whittemore. Dissolved oxygen was depressed to near zero below the Whittemore discharge, but recovered rapidly. Ammonia-nitrogen, however, increased to a standards violation of 6.2 mg/l and remained above the 2 mg/l water quality standard for a distance of more than 3 miles.

## Conclusion

With the exception of fecal coliform contamination below the larger discharges, water quality of the East Fork Des Moines has been found to meet water quality standards even during low stream flow and difficult winter conditions. Previously reported problems caused by the Bancroft municipal discharge have apparently been corrected since the new city wastewater treatment facility has gone into operation. The Algona plant, although apparently operating satisfactorily at the time of the surveys, is a potential problem and should be upgraded to assure future reliability, particularly for nitrification of ammonia. The fixed station monitoring suggests that nonpoint source problems may also exist. Significant water quality improvement is needed on Lotts Creek. Domestic and industrial waste discharges have caused chronic water quality problems on Lotts Creek through the years. Basin plan water quality modeling has determined that advanced wastewater treatment will be required at Whittemore to meet water quality standards at low stream flows.

## Forecast

With provision for ammonia nitrification facilities at Algona and treatment upgrading at Whittemore, fishable-swimmable criteria at non-runoff stream flows should be met in full. Nonpoint source effects have not yet been adequately assessed.

## Data Needs

### Quarterly Monitoring Stations

Data from the station at Dakota City correlate well with intensive survey data. The station monitors most of the basin, is located less than one mile from a USGS flow measuring station, and should remain in the network.

### Intensive Surveys

A survey during winter low flow would be desirable, and additional runoff related data is also needed.

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | Discharge P.E. After | Construction Cost |
|---|---|---|---|
| | 1974 | | |
| | NONE | | |
| | 1975 | | |
| Bancroft | 428 | 70 | $ 301,600 |
| | 1976 and 1977 | | |
| | NONE | | |

## TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Algona | 1,104 | 827 | $ 1,189,000 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## WEST FORK DES MOINES RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High suspended solids and turbidity at high flow | Nitrate and soluble phosphate, moderate, below major discharges | TDS high upstream, decreases downstream | D.O. violations below major point sources | Point source fecal coliform at Estherville |

Fixed Quarterly Monitoring Stations 1975 - 1976

At Humbolt

Elevated values: fecal coliform (4,600/100 ml), turbidity (180 JTU), suspended solids (390 mg/l), COD (90 mg/l), nitrate (4.3 mg/l). Ammonia, BOD and soluble phosphate were low. D.O. was near saturation winter and highly supersaturated (up to 225%) summer. Barium, copper, and zinc were detected, but below standards limits.

Intensive Surveys

January 1974 - normal stream flow, (620) x 7 day $Q_{10}$

The survey was conducted during a cold weather period and there was ice cover, but the stream flow rate was favorable and the water quality was acceptable. At low flows, the West Fork is significantly impacted by point sources, but this time there was enough dilution that there was no pronounced degradation found at any of the discharges. The principal contaminant was fecal coliform, which was found at high levels below Estherville (26,000/100 ml) and Humboldt (1,400/100 ml), but which otherwise was at acceptably low counts. BOD and ammonia, which are good indicators of point source contamination, were at low concentrations, although Estherville caused a small increase in ammonia at one station. Of the nutrients, nitrate was relatively high all along the reach and soluble phosphate was high below Estherville, but otherwise moderate. As would be expected under ice cover dissolved oxygen concentrations were depressed below the saturation point but did not go below the water quality standards limit.

## Conclusion

When the stream flow rate is favorable the West Fork can maintain satisfactory water quality even under difficult winter conditions. During dry periods, however, the stream flow drops to very low rates and the point source discharges, including Estherville, Emmetsburg, and Humboldt can cause very poor water quality. Previously observed adverse effects are documented in the 1975 "Water Quality Report". It is important, therefore, that the major discharges be upgraded in treatment effectiveness, particularly ammonia nitrification. The quarterly fixed station monitoring data suggest that the West Fork also experiences significant nonpoint source impacts.

## Forecast

In the time since the January 1974 survey, a newly upgraded city of Emmetsburg wastewater treatment plant has gone into operation and is achieving a high degree of treatment. A new Estherville plant is in the final stage of readiness for operation. The plants are designed to meet waste load limits established in the basin plan to meet water quality standards at drought flow, so the next survey should show much improved water quality, and standards at low stream flow should be fully met in the future. Nonpoint source related quality has not been adequately assessed, but need for some control is likely.

## Data Needs

### Fixed Station Monitoring

Data from the station at Humboldt correlates reasonably well with intensive survey data. The station monitors almost the entire West Fork basin and is located near a USGS flow measuring station, so should remain in the network at its present site.

### Intensive Surveys

A survey should be scheduled during low flow conditions after improvements at the major point sources are completed.

## WEST FORK DES MOINES RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | | Construction |
|---|---|---|---|---|
| | Before | | After | Cost |
| | | 1974 | | |
| Mallard | NPETP | | 40 | $ 76,200 |
| | | 1975 | | |
| | | NONE | | |
| | | 1976 | | |
| Emmetsburg | 730 | | 170 | 1,919,800 |
| | | 1977 | | |
| Rutland | NPETP | | 45 | 75,900 |
| TOTAL | 730 | | 255 | $2,071,900 |

### TREATMENT FACILITY UPGRADES NEEDED
### (Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Estherville | 13,680 | 1,250 | $ 9,605,500 |
| Humboldt | 680 | 680* | 912,000 |
| TOTAL | 14,860 | 1,930 | $10,517,500 |

NPETP = No Prior Existing Treatment Plant

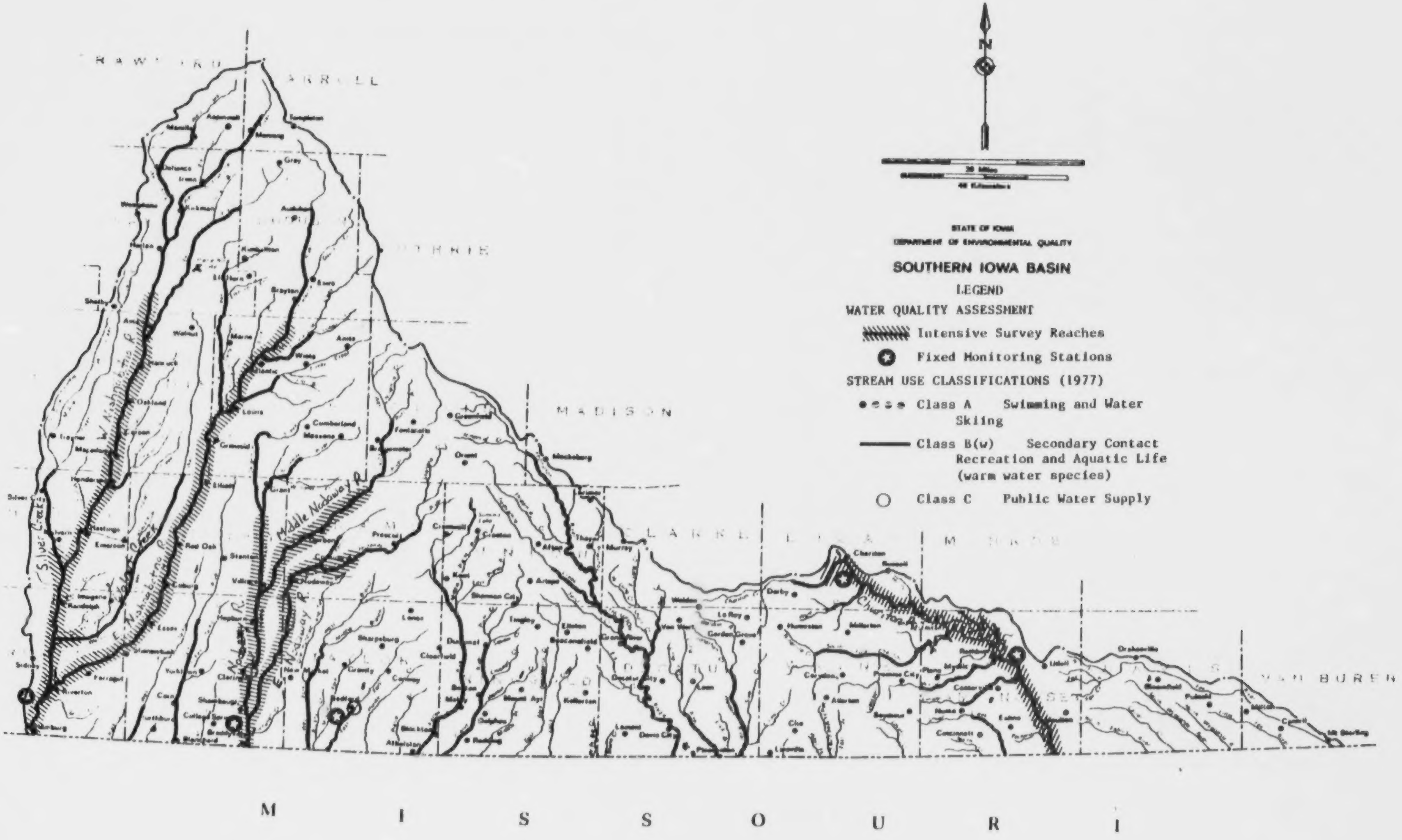
PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

* Upgrade required to reduce the ammonia concentration.

# REPORT
# ON
# IOWA SURFACE WATER QUALITY
# 1978

## SOUTHERN RIVER BASINS

Iowa Department of Environmental Quality
Chemicals and Water Quality Division


STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY
SOUTHERN IOWA BASIN
LEGEND
WATER QUALITY ASSESSMENT
Intensive Survey Reaches
Fixed Monitoring Stations
STREAM USE CLASSIFICATIONS (1977)
Class A Swimming and Water Skiing
Class B(w) Secondary Contact Recreation and Aquatic Life (warm water species)
Class C Public Water Supply
N
20 Miles
40 Kilometers
CRAWFORD
CARROLL
GUTHRIE
MADISON
CLARKE
LUCAS
MONROE
WAPELLO
VAN BUREN
MISSOURI
Silver Creek
W. Nishnabotna R.
E. Nishnabotna R.
Middle Nodaway R.
E. Nodaway R.
Nodaway R.
Chariton R.

Southern Iowa River Basins
Data Needs Summary

| | Intensive Surveys | | Fixed Stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | Existing | | Recommended Additions/Relocations/Deletions | | |
| | Current Data Available | Data Needs Priority | Location | Value | | Location | Priority |
| Fox River | No | 3 | | | add | nr state line | Low |
| Chariton River | | | | | | | |
| above Lake Rathbun | Yes | 2 | below Chariton | good | | | |
| Lake Rathbun | Reserved | 3 | | | | | |
| below Rathbun | Yes | 4 | above Centerville | good | | | |
| Thompson River | No | 2 | | | add | nr Davis City | High |
| Grand River | No | 3 | | | add | nr state line | Low |
| Platte River | No | 3 | | | add | nr state line | Low |
| East Fork 102 River | No | 3 | Near Bedford | Low Priority | | | |
| West Fork 102 River | No | 3 | | | add | nr state line | Low |
| Nodaway River | Yes | 4 | Near Shambaugh | good | | | |
| East Nodaway River | Yes | 4 | | | add | nr mouth | Low |
| Middle Nodaway River | Yes | 4 | | | add | nr mouth | Low |
| Tarkio River | No | 3 | | | add | nr state line | Low |
| West Tarkio Creek | No | 3 | | | add | nr state line | Low |
| Nishnabotna River | | | Near Hamburg | good | | | |
| East Nishnabotna River | Yes | 5 | | | add | above Red Oak | High |
| West Nishnabotna River | Yes | 5 | | | add | above Oakland | High |
| Silver Cr. | 1 station | 4 | | | add | above Harlan | Med |
| Walnut Cr. | 1 station | 4 | | | add | nr mouth | Low |

Intensive Survey Priorities

1. Urgent
2. Needed to assess a suspected problem
3. No recent information, but no unusual problems suspected
4. Recent data available, but current trend information desirable
5. Can be deferred until after point source upgrading

## Southern Iowa River Basins
## Water Quality Summary

| | WQ Class. (Water Use) | WQ Problems | Expected to Meet WQ Goals - Point Source Treatment Needs | Nonpoint Source Control Needs |
|---|---|---|---|---|
| Fox River | Unclassified | NCD | BPT | N/A |
| Chariton River | | | | |
| above Lake Rathbun | B(W) | 1,2,3,5,6,7 | AWWT | 2 |
| below Lake Rathbun | B(W) | 6,7,8 | BPT | 2 |
| Lake Rathbun | A,B(W)C | Reserved | --- | --- |
| Thompson River | B(W) | NCD | | |
| Grand River | B(W) | NCD | | |
| Platte River | B(W) | NCD | | |
| East Fork 102 River | B(W)C | 3,6,7 | BPT | N/A |
| West Fork 102 River | B(W) | NCD | | |
| Nodaway River | B(W) | 5,6,7 | BPT | 1-2 |
| East Nodaway River | B(W) | 5,6,7 | BPT | 1-2 |
| Middle Nodaway River | B(W) | 6,7 | BPT | 1-2 |
| Tarkio River | B(W) | NCD | | |
| West Tarkio Creek | B(W) | NCD | | |
| Nishnabotna River | | | | |
| East Nishnabotna River | B(W) | 1,2,3,5,6,7 | AWWT | 1 |
| West Nishnabotna River | B(W) | 1,2,3,5,6,7 | AWWT | 1 |
| Walnut Cr. | B(W) | 3,6,7 | BPT | N/A |
| Silver Cr. | B(W) | 3,6,7 | BPT | N/A |

WQ Classification (Water Use): A, Swimming and Water Skiing; B, Aquatic Life and Secondary Contact Recreation; (W) Warm Water Aquatic Species; C, Public Water Supply.

WQ Problems: 1, Dissolved Oxygen; 2, Ammonia; 3, Nutrients; 4, Salinity, Alkalinity, Acidity; 5, Fecal Coliform, Point Source; 6, Fecal Coliform, Nonpoint Source; 7, Turbidity, Suspended Solids; 8, Toxic Substances; 9, Temperature; NCD, No Current Data.

Point Source Treatment Needs: BPT, Best Practicable Control Technology; AWWT, Advanced Wastewater Treatment-treatment beyond standard secondary.

Scale of Nonpoint Source Control Needs: 1, Major; 2, Extensive; 3, Minor; NA, Not Known.

## CHARITON RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Occasions of high suspended solids and turbidity | High nutrient levels above reservoir, low below | Below critical levels | Low D.O.'s not uncommon above the lake | Copper and lead have been detected below the lake |

Fixed Quarterly Monitoring Stations 1975 - 1976

### Below Chariton

Elevated values: fecal coliform (96,000/100 ml), Nitrate (4.9 mg/l), soluble phosphate (0.33 mg/l), suspended solids (400 mg/l), COD (88 mg/l), turbidity (340 JTU), Manganese (940 mg/l). BOD and ammonia were low. D.O. was below saturation (55-92%) winter and below the WQ standard summer (3.7 mg/l = 41% saturation). Barium, chromium, copper, lead and zinc were detected, but below standards limits.

### Below Rathbun Dam

Elevated values: fecal coliform (7,400/100 ml), suspended solids (104 mg/l), copper (20 ug/l), lead (120 ug/l), manganese (790 mg/l). Ammonia, nitrate, soluble phosphate, BOD and COD were low. D.O. was near saturation winter and summer. Barium and zinc were detected, but below standards limits.

Intensive Surveys

### September 1976 - low stream flow

This was a limited scope survey, with samples taken at 3 stations above the reservoir and one station below Centerville. Water quality, except for dissolved oxygen concentration, was satisfactory. Fecal coliform and BOD were low. Ammonia, nitrate and soluble phosphate were also low but significant increases in the concentrations of these parameters were noted immediately below Chariton. Suspended solids were moderately high and floating algae were reported. Dissolved oxygen was significantly depressed, with a standards violation of 3.2 mg/l above Chariton. Because the samples were collected in the very early morning and water quality was not otherwise seriously degraded, the low D.O. value was assumed to be a dark hours sag caused by algal respiration. However, values of only 5.9 mg/l and 7.5 mg/l were found downstream at 9:00 a.m. and 8:00 a.m. respectively, so there is indication that there is sufficient organic load on the river to create a stress on the dissolved oxygen. Low D.O.'s have also been found in the river below Chariton in previous surveys and in the fixed station monitoring. The sample below the reservoir had a dissolved oxygen concentration of 8.6 mg/l and the other substances tested were at acceptable levels.

## Conclusion

Water quality improvement is needed. Adverse point source effects, particularly elevated fecal coliform counts and increases in nutrient levels have been observed below Chariton. Dissolved oxygen has also been a chronic problem, probably caused by a combination of background concentrations of organic substances, the Chariton wastewater effluent, and the slow and sluggish character of the stream. The fixed station monitoring data suggest that there are significant nonpoint source inputs also. High levels of suspended solids, turbidity, and manganese which is a soil constituent in the area, attest to the effects of runoff. Rathbun Reservoir tends to improve the water quality at downstream stations by decreasing the nutrient levels and suspended materials, and increasing the dissolved oxygen concentration. However, the nutrient and organic reductions are at the expense of undesirable lake eutrophication impacts.

## Forecast

Water quality in the river is for the most part meeting fishable-swimmable criteria. The planned upgrading of the Chariton municipal treatment facility will reduce the fecal coliform levels flowing into Rathbun Reservoir and help in reducing the nutrient loads on the lake and the organic loads contributing to stress on dissolved oxygen in the river. Nonpoint source effects will be more difficult to control. However, Rathbun Reservoir is an excellent water resource for recreation and water supply and is deserving of careful water quality management.

## Data Needs

### Fixed Station Monitoring

The existing stations are strategically sited for measurement of water quality into and out of Rathbun Reservoir and should be retained in the network. Consideration might be given to establishing a station on the South Fork Chariton, but no unusual water quality problems are anticipated from that area, and the background quality is probably not sufficiently different from that in the mainstem Chariton to warrant a high priority for monitoring.

### Intensive Surveys

The water quality problems observed upstream from the reservoir suggest that the stream should be monitored as often as resources permit. A comprehensive survey of the lake proper should also be conducted periodically, perhaps in cooperation with other governmental agencies such as the State Conservation Commission and the U.S. Corps of Engineers.

# CHARITON RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

| | |
|---|---|
| None | 1974, 1975, 1976, 1977 |

## TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Centerville | | 2,350* | $2,065,500 |
| Chariton | 840 | 300 | 2,806,000 |
| TOTAL | | 2,650 | $4,871,500 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

*Total for Northwest and West plants.

## EAST FORK ONE HUNDRED AND TWO RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Nonpoint source effects suspected | Soluble phosphate and nitrate abundant | Below critical levels | Low oxygen demanding loading | Low in harmful substances |

Fixed Quarterly Monitoring Station 1975-1976

Near Bedford

Elevated values: fecal coliform (10,400/100 ml), turbidity (330 JTU), suspended solids (1000 mg/1), nitrate (4.6 mg/1), soluble phosphate (0.35 mg/1), total phosphate (0.42 mg/1). Ammonia, BOD, COD and turbidity were generally low. D.O. was near saturation (74-106%) winter and supersaturated (101 - 130%) summer. Barium, chromium, copper, lead and zinc were detected, but below standards limits.

Intensive Surveys

None

## Conclusion

There is only a minimal amount of water quality data existing, and it is not conclusive. Nonpoint source related values, soil or suspended solids and turbidity, were generally low, but occasional high values (noted in the spring) suggest that runoff events may cause problems. The stream is lightly loaded in terms of point sources, and oxygen demand problems have not been observed.

## Forecast

Fishable-swimmable water quality criteria should be met, but some nonpoint source control is probably necessary.

## Data Needs

### Quarterly Monitoring Stations

Due to the limited drainage area and minimal number and size of discharges, the station is low priority. However, it is conveniently close to the sample collection laboratory.

### Intensive Surveys

A runoff affected survey should be conducted to obtain a better assessment of nonpoint source control needs. In view of statewide monitoring needs, however, a survey of this stream would be low priority.

## Treatment Facility Status

The Bedford municipal sewage treatment plant is the only continuous wastewater discharge in the basin, and is not defined as a major discharge. It's age has exceeded it's design life, however, and this plant must be upgraded to meet secondary treatment criteria.

## NODAWAY RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity and suspended solids at high flow | Nutrients generally low | Below critical levels | Oxygen demanding loads not a critical factor | Fecal coliform, point and nonpoint |

Fixed Quarterly Monitoring Stations 1975 - 1976

Near Shambaugh

Elevated values: fecal coliform (9,200/100 ml), total solids (1000 mg/1), suspended solids (960 mg/1), turbidity (310 JTU). Ammonia, BOD and soluble phosphate were low. D.O. was depressed winter (70% saturation) and supersaturated summer (122%). Barium, chromium, copper and zinc were detected, but below standards limits.

Intensive Surveys

August 1974 - normal stream flow, (10) x 7 day $Q_{10}$

This was the first of a two part survey to demonstrate the effects on water quality of summer versus winter temperature variations. Water quality was sampled on the West, Middle and East Nodaway Rivers and was found to be good. Fecal coliform, ammonia, nitrate, suspended solids, BOD, COD and turbidity were all low. Dissolved oxygen was supersaturated. The only point source impacts that were detected were slight increases in fecal coliform, suspended solids, and oxygen demand at the station below Corning, and a moderate increase in fecal coliform below Clarinda. The number of organisms and species diversity found in sampling the aquatic invertebrate community was also indicative of good water quality.

January 1975 - normal stream flow, (14) x 7 day $Q_{10}$

During this winter segment of the survey, heavy ice cover was found throughout the basin. Water quality on the East and West Nodaway was generally good. BOD, COD, turbidity, suspended solids and ammonia were low. However, nitrate was abundant and fecal coliform violations and modest increases in soluble phosphate were found below Clarinda and Corning. Dissolved oxygen was depressed (49-78% saturation) because of lack of reaeration under the ice, but was not below the water quality standard. Water quality of the Middle Nodaway was generally poorer than on the East and West Nodaway, but for no apparent reason. Only one point source discharge is located on the stream and it was not discharging at the time of the survey. Only fecal coliform was found to violate standards.

## Conclusion

At these favorable stream flow rates, waste discharges are not having great effect, even under ice cover, and water quality is satisfactory. The intensive surveys did not provide information on nonpoint source related water quality. However, the presence of erodible type soil and reaches of straightened channel in the basin support the suggestion from fixed station monitoring, that runoff related problems may be significant.

## Forecast

There are few large point sources in the basin and modeling studies bear out the water quality data in predicting that basin-wide secondary treatment, with nitrification at Corning and Clarinda, will permit full attainment of water quality standards. Solving the suspected silt load problem may be more difficult, and nonpoint source controls will probably be needed.

## Data Needs

### Fixed Station Monitoring

The Shambaugh station is well sited, in that it monitors the entire Iowa portion of the basin. Consideration could be given to installation of stations on the East and Middle branches, but the data would probably be repetitive of the Shambaugh data.

### Intensive Surveys

A runoff affected survey should be conducted. Future low flow surveys, however, could await completion of other higher priority work.

## NODAWAY RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | | After | Construction Cost |
|---|---|---|---|---|
| | | 1974 | | |
| Braddyville | NPETP | | 12 | $ 62,900 |
| | | 1975 & 1976 | | |
| | | NONE | | |
| | | 1977 | | |
| Bridgewater | NPETP | | 58 | 103,300 |
| TOTAL | | | 70 | $166,200 |

### TREATMENT FACILITY UPGRADES NEEDED
### (Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Clarinda | 710 | 710* | $985,000 |

NPETP = No Prior Existing Treatment Plant

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

* Upgrade required to reduce the ammonia concentration.

## NISHNABOTNA RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity and suspended solids at high flow | High ammonia and phosphate below discharges | Below critical levels | D.O. standards violations at low flow | Fecal coliform below discharges and at high flow |

Fixed Quarterly Monitoring Stations 1975-1976

At Hamburg

Elevated values: suspended solids (562 mg/l), turbidity (150 JTU), nitrate (4.1 mg/l), fecal coliform (16,000/100 ml). COD, BOD and ammonia were low. D.O. was depressed winter (52-62% saturation) and supersaturated summer (142%). Barium, cadmium, copper, lead, and zinc were detected, but below standards limits.

Intensive Surveys

September 1974 - normal stream flow, (12-24) x 7 day $Q_{10}$

This warm weather survey found generally good water quality on both the east and west branches of the river. The stream flow rate was considerably greater than critical low flow conditions, so point source impacts were not pronounced. Turbidities were not high, so nonpoint source impacts were apparently not a large factor either. However, in comparison to the data from the East Nishnabotna, suspended solids concentrations in the West Nishnabotna were relatively high, suggesting some source of suspended materials not common to the two drainage areas during the survey period. The biochemical oxygen demand and ammonia-nitrogen concentrations, which are indicators of organic waste levels, were at low levels, but the nitrogen and phosphate nutrients were present in moderate concentrations. Dissolved oxygen levels were very good. The only appreciable point source degredation effects were high fecal coliform counts below Atlantic on the east branch and Harlan on the west branch. Silver and Walnut Creeks were sampled at one station near the mouth of each stream, and found to have water quality similar to that of the West Nishnabotna.

January 1975 - normal stream flow, (13-22) x 7 day $Q_{10}$

This survey was a follow-up to the September survey to determine cold weather variations. There was heavy ice cover throughout the basin, but again the stream flow rate was well above the low flow conditions that would normally create a stress on water quality. Again the only serious point source degradation was fecal coliform standards violations below Shenandoah on the east branch and Harlan and Oakland on the west branch. Dissolved oxygen concentrations were below saturation levels, as would be expected under ice cover, but stayed better than the water quality standard. BOD, COD, and ammonia nitrogen concentrations were low and nutrients moderately abundant. Turbidity and suspended solids levels were lower than in the fall, probably because of the absence of any runoff carried materials and inhibition of algal growth caused by the ice cover. Water quality at the mouth of Walnut and Silver Creeks was better than that in the West Nishnabotna, particularly the dissolved oxygen concentrations which were 9.8 mg/l and 11.9 mg/l.

January 1977 - low stream flow, (3-6) x 7 day $Q_{10}$

The survey covering only the West Nishnabotna again found heavy ice cover, but the stream flow rate was much lower and the water quality was correspondingly poor. As would be expected, nonpoint source input was not a factor and turbidity was low. Point source effects, however, were pronounced. The principle sources of degradation were the municipal wastewater plant at Harlan and the American Beef Packers industrial waste stabilization pond at Oakland. Below Harlan the ammonia nitrogen concentration rose from 0.87 mg/l to 5.0 mg/l and the dissolved oxygen decreased from an already inadequate concentration of 4.7 mg/l to 1.4 mg/l. The quality improved gradually in the reach to Oakland, but again degraded below the American Beef Packers discharge to 7.1 mg/l ammonia and 4.0 mg/l dissolved oxygen. The fecal coliform count was also increased below Oakland to 1500/100 mg/l. At stations further downstream from Oakland the water quality again gradually improved to satisfactory levels. At the station below the inflow from the East Nishnabotna, however, there was a high fecal coliform count and a reduction in dissolved oxygen concentration which suggests that with the heavy ice cover and low stream flow conditions there were water quality problems on the East Nishnabotna also. Findings of small increases in fecal coliform and suspended solids below Carson and Macedonia indicate that the small discharges can have an adverse affect also, but not as pronounced as the larger ones. Water quality at the mouth of Silver Creek was satisfactory, despite the difficult environment, and Walnut Creek was completely frozen so a sample could not be obtained.

## Conclusion

The existing water quality is quite dependent on stream flow rate. When flows are in the range found in the 1974-75 surveys, most of the water quality standards can be met and the principle degradation is fecal coliform. When the flow rate is low, however, and particularly when winter weather sets in, dissolved oxygen and ammonia nitrogen join fecal coliform in standards violations. Nevertheless, the 1977 winter survey found better water quality than observed in a similar winter survey in 1972. The improvement was attributed to an improvement in treatment performance at Harlan and a decrease in the volume of waste discharged from American Beef Packers. Although the surveys did not provide runoff information, nonpoint source problems are known to exist. There are highly erodible soils in the basin, and the Nishnabotna is characterized by deep steep stream banks. The existance of poor water quality and heavy silt loads at high stream flows was described in the 1975 Water Quality Report, and is supported by the current fixed station monitoring data.

## Forecast

The basin plan for the Nishnabotna calls for more stringent than secondary treatment for several discharges, most of which have been identified as problem sources at their present level of treatment. The basin plans wasteload allocations are set to meet standards at drought flow, so implementation should permit attainment of fishable-swimmable criteria in the range of normal and low flows. Attainment of nonturbid, low solids conditions at high flow is doubtful, however, because of the heavy silt loads resulting from extensive channel straightening and highly erodible soils in the area.

## Date Needs

### Fixed Station Monitoring

The station at Hamburg monitors the entire Iowa portion of the basin, so in a one station configuration it is strategically sited. However, one station does not adequately represent the water quality of the basins and stations should be added at intermediate locations, on both the West Nishnabotna and the East Nishnabotana. Stations would also be desirable on Walnut Creek and Silver Creek, but would have lower priority.

### Intensive Surveys

A survey at low flow should be scheduled after upgrading is completed at the major discharges, in order to determine the extent of water quality improvement.

## NISHNABOTNA RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | After | Construction Cost |
|---|---|---|---|
| | 1974 | | |
| Malvern | | 120 | $ 208,100 |
| Shelby | 300 | 130 | 116,100 |
| | 1975 | | |
| | NONE | | |
| | 1976 | | |
| Templeton | NPETP | 30 | 92,200 |
| | 1977 | | |
| | NONE | | |
| TOTAL | 850 | 280 | $ 416,400 |

## TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge | | |
|---|---|---|---|
| | Current | Required | Construction |
| American Beef Packers @ Oakland | 460 | 460* | --- |
| Atlantic | 920 | 510 | $1,090,000 |
| Audubon | 1,020 | 470 | 2,129,000 |
| Harlan | 1,490 | 520 | 2,388,700 |
| Red Oak | 1,510 | 1,200 | 1,410,000 |
| Shenandoah | 1,880 | 1,200 | 1,074,000 |
| TOTAL | 7,284 | 4,361 | $8,091,700 |

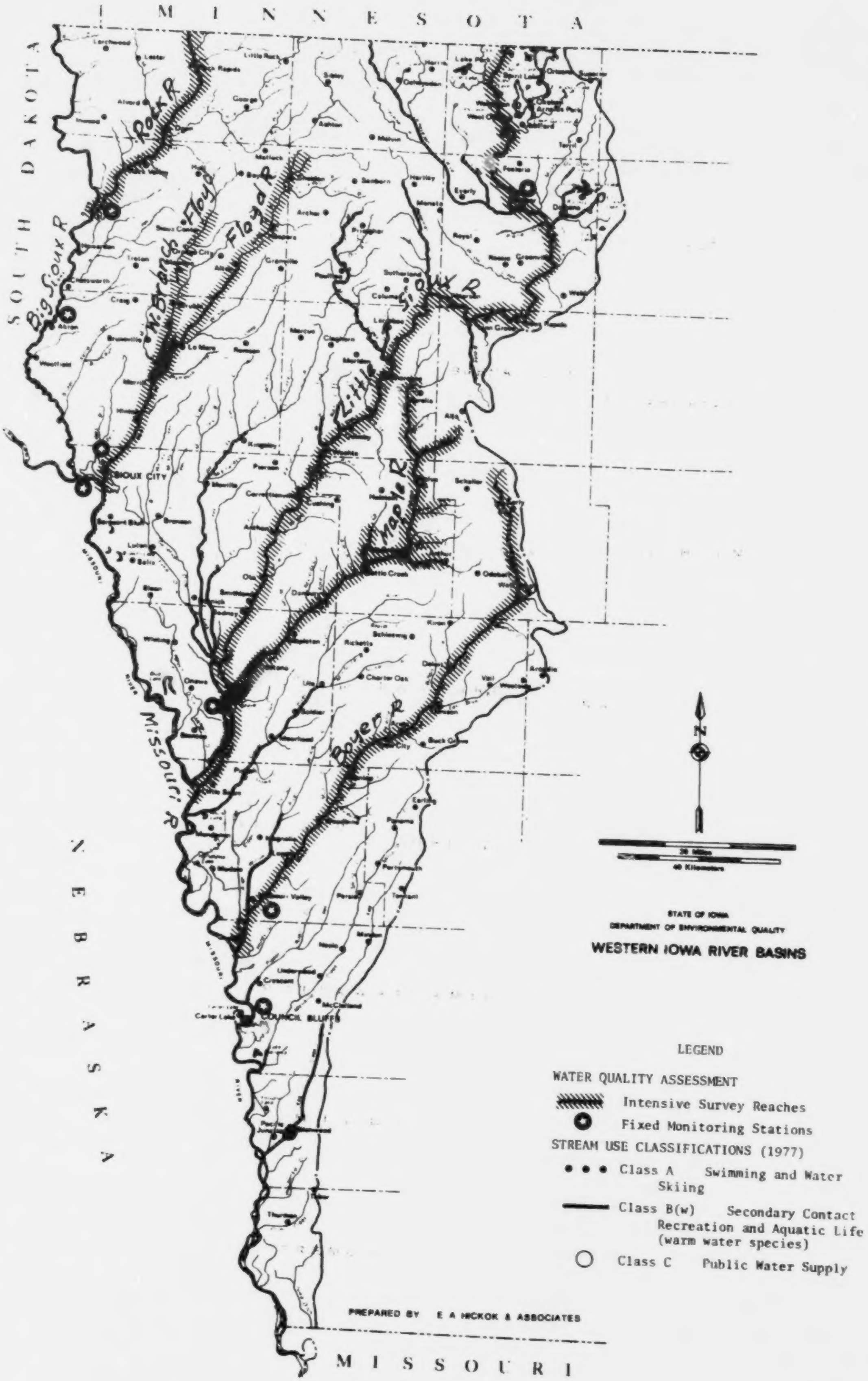
NPETP = No Prior Existing Treatment Plant
PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

*Upgrade required to reduce suspended solids concentration.

# REPORT
# ON
# IOWA SURFACE WATER QUALITY
# 1978

## WESTERN IOWA RIVER BASINS

Iowa Department of Environmental Quality
Chemicals and Water Quality Division


MINNESOTA
SOUTH DAKOTA
NEBRASKA
MISSOURI
Rock R
Big Sioux R
N. Branch Floyd
Floyd R
Little Sioux R
Maple R
Boyer R
Missouri R
SIOUX CITY
COUNCIL BLUFFS
N
20 Miles
40 Kilometers

STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY
**WESTERN IOWA RIVER BASINS**

LEGEND

WATER QUALITY ASSESSMENT
▨ Intensive Survey Reaches
● Fixed Monitoring Stations

STREAM USE CLASSIFICATIONS (1977)
• • • Class A Swimming and Water Skiing
— Class B(w) Secondary Contact Recreation and Aquatic Life (warm water species)
○ Class C Public Water Supply

PREPARED BY E A HICKOK & ASSOCIATES

## Western Iowa River Basins
## Water Quality Summary

| | WQ Class. (Water Use) | WQ Problems | Expected to Meet WQ Goals - Point Source Treatment Needs | Nonpoint Source Control Needs |
|---|---|---|---|---|
| Missouri River | A,B(W),C | 5,6,7 | BPT | 1 |
| Keg Creek | B(W),C | NCD | | |
| Mosquito Creek | B(W) | NCD | | |
| Pigeon Creek | B(W) | NCD | | |
| Boyer River | | | | |
| Below Denison | B(W) | 1,2,3,5,6,7 | AWWT | 1 |
| Above Denison | B(W) | 3,6,7 | BPT | 2 |
| Willow Creek | B(W) | NCD | | |
| Soldier River | B(W) | NCD | | |
| Little Sioux River | | | | |
| Mouth to Correctionville | B(W) | 3,6,7 | BPT | 1 |
| Correctionville to Minnesota | B(W) | 1,2,3,4,5,6,7 | AWWT | 2 |
| Maple River | B(W) | 1,2,3,5,6,7 | BPT | 1 |
| Battle Creek | B(W) | 7 | None | 2 |
| Odebolt Creek | B(W) | 1,2,5,7 | AWWT | 2 |
| Little Maple River | B(W) | 1,2,5,7 | AWWT | 2 |
| W. Fork Little Sioux River | B(W) | NCD | | |
| Mill Creek | B(W) | NCD | | |
| Waterman Creek | B(W) | NCD | | |
| Ocheyedan River | B(W) | NCD | | |
| Floyd River | | | | |
| Mouth to Merrill | B(W) | 3,4,6,7 | BPT | 1 |
| Above Merrill | B(W) | 1,2,3,4,5,6,7 | AWWT | 1-2 |
| W. Br. Floyd | B(W) | 1,2,3,4,5,6,7 | AWWT | 1-2 |
| Big Sioux River | B(W) | 1,2,3,4,7 | AWWT | 1-2 |
| Rock River | B(W) | 1,2,3,4,5,7 | AWWT | 2 |

WQ Classification (Water Use): A, Swimming and Water Skiing; B, Aquatic Life and Secondary Contact Recreation; (W) Warm Water Aquatic Species; C, Public Water Supply.

WQ Problems: 1, Dissolved Oxygen; 2, Ammonia; 3, Nutrients; 4, Salinity, Alkalinity, Acidity; 5, Fecal Coliform, Point Source; 6, Fecal Coliform, Nonpoint Source; 7, Turbidity, Suspended Solids; 8, Toxic Substances; 9, Temperature; NCD, No Current Data.

Point Source Treatment Needs: BPT, Best Practicable Control Technology; AWWT, Advanced Wastewater Treatment - treatment beyond standard secondary.

Scale of Nonpoint Source Control Needs: 1, Major; 2, Extensive; 3, Minor; NA, Not Known.

## Western Iowa River Basins

## Data Needs Summary

| | Intensive Surveys | | Fixed Stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | Existing | | Recommended Additions/Relocations/Deletions | | |
| | Current Data Available | Data Needs Priority | Location | Value | | Location | Priority |
| Missouri River | No | 2 | above Sioux City | Good | add | at Missouri Border | Med. |
| | | | above Council Bluffs | Good | | | |
| Keg Creek | No | 3 | | | add | at Mouth | Med. |
| Mosquito Creek | No | 3 | | | add | at Mouth | Med. |
| Pigeon Creek | No | 3 | | | add | at Mouth | Low |
| Boyer River Below Denison | Yes | 5 | nr. Missouri Valley | Good | add | at Dow City | Low |
| Above Denison | Yes | 4 | | | add | above Denison | Med. |
| Willow Creek | No | 3 | | | add | at Mouth | Low |
| Soldier River | No | 3 | | | add | at Mouth | Med. |
| Little Sioux River below Correctionville | Yes | 4 | nr. Turin | Good | | | |
| above Correctionville | Yes | 5 | above Spencer | Good | add | at Washta | Med. |
| Maple River | Yes | 4 | | | add<br>add | at Castana<br>above Odebolt Cr. | High<br>Med. |

| | Intensive Surveys | | Fixed Stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | Existing | | Recommended Additions/Relocations/Deletions | | |
| | Current Data Available | Data Needs Priority | Location | Value | | Location | Priority |
| Little Sioux River (Cont) | | | | | | | |
| Battle Creek | Yes | 4 | | | | | |
| Odebolt Creek | Yes | 5 | | | | | |
| Little Maple River | Yes | 5 | | | | | |
| West Fork Little Sioux R. | No | 2 | | | add | below Wolf Cr. | Med. |
| Mill Creek | No | 3 | | | add | at Mouth | Low |
| Waterman Creek | No | 3 | | | add | at Mouth | Low |
| Ocheyedan River | No | 3 | | | add | at Mouth | Med. |
| Floyd River | | | | | | | |
| below Merrill | Yes | 4 | above Sioux City | OK for background | move to | Nr. Merrill | High,<br>or |
| above Merrill | Yes | 5 | | | add | above W. Br. | Med. |
| W. Br. Floyd | Yes | 5 | | | add | at Mouth | Med. |
| Big Sioux River | No | 4 | at Akron | Good | add | nr. Minn. Border | Med. |
| Rock River | Yes | 2 | at Mouth | OK for background | move to | nr. Rock Valley | High |

Intensive Survey Priorities

1. Urgent
2. Needed to assess suspected problem
3. No recent information, but no unusual problems suspected
4. Recent data available, but current trend information desirable
5. Can be deferred until after point source upgrading

MISSOURI RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity and suspended solids at high spring flow | Ammonia, nitrate, and soluble phosphate low | Below critical levels | DO near saturation summer and winter | Fecal Coliform violations below major discharges |

Fixed Quarterly Monitoring Stations 1975-1976

Above Sioux City

Elevated values: suspended solids (870 mg/1), turbidity (280 JTU), fecal coliform (4,700/100 ml), total phosphate (0.87 mg/1), COD (79 mg/1). Fecal coliform, BOD, COD, ammonia, nitrate and soluble phosphate were usually low. DO was near saturation (80-98%) both summer and winter. Barium, chromium, copper, lead and zinc were detected, but below standards limits.

Above Council Bluffs

Elevated values: fecal coliform (11,600/100 ml), suspended solids (520 mg/1), turbidity (220 JTU), total phosphate (0.46 mg/1). BOD, COD, ammonia, nitrate, and soluble phosphate were usually low. DO was near saturation (83-95%) both summer and winter. Barium, chromium, copper, lead and zinc were detected, but below standards limits.

Intensive Surveys

None

## Conclusion

Although infrequent elevated values have been noted, water quality was, in general, good during the sampling period at these stations. The values that were high were nonpoint source related constituents, and the high suspended solids and turbidity are characteristic of the Missouri. However, the fixed sampling station locations do not provide for effective monitoring of the local effects of the major point source discharges. The consistently high fecal coliform levels at Council Bluffs may well be due in part to the discharges at Sioux City and Dakota City.

## Forecast

Point source effects can be minimized sufficiently. Council Bluffs municipal treatment facilities were recently improved and a new Sioux City plant is under construction. Nebraska side (including Omaha) improvements are also planned. Decreasing the silt load and turbid conditions of the river is ~~are~~ more difficult to forecast, however, because of the extremely large nonpoint drainage area above the Iowa-Nebraska reach, and the effects of flow regulation through upstream impoundments.

## Data Needs

### Quarterly Monitoring Stations

The fixed stations do not adequately monitor the major discharges, but the nonpoint source character of the Missouri is probably of greater concern than point source related quality. When the planned treatment plant construction is completed, the point sources should produce little impact. Therefore, the stations should be retained in the network at their present locations, but consideration should be given to adding a station near the Iowa-Missouri border to monitor the water quality leaving the Iowa segment.

### Intensive Surveys

A low stream flow survey should be scheduled in order to better assess present point source impacts.

## MISSOURI RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | | Construction |
|---|---|---|---|---|
| | Before | | After | Cost |
| | | 1974<br>NONE | | |
| | | 1975<br>NONE | | |
| Council Bluffs | 62,900 | 1976 | 8,500 | $9,377,000 |
| | | 1977<br>NONE | | |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Onawa | 830 | 670 | $ 560,000 |
| Sioux City | 287,680 | 31,010 | 21,155,800 |
| Terra Chemicals International @ Sioux City | 10,250 | 1,530 | --- |
| TOTAL | 298,760 | 33,210 | $21,715,800 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## BIG SIOUX RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity and suspended solids | High nutrient levels | High TDS and chloride | Supersaturated DO summer, standards violations winter | Fecal coliform generally low |

Fixed Quarterly Monitoring Stations 1975-1976

### At Akron

Elevated Values: Ammonia (7.5 mg/l), soluble phosphate (1.8 mg/l), fecal coliform (3100/100 ml), TDS (966 mg/l), suspended solids (870 mg/l), COD (130 mg/l), BOD (20 mg/l), turbidity (360 JTU), chloride (140 mg/l), manganese (2000 mg/l). DO varied from supersaturated in summer to below the standard (1.4 mg/l) in winter. Barium, chromium, copper and zinc were detected, but below standards limits.

## Intensive Surveys

None

## Conclusions

Although the recent data is minimal in quantity, it supports the conclusion of continuing poor water quality, as documented in the 1975 305(b) Report and the 1978 "Violations Report". The major problems continue to be the point source degraded character of the water entering the state from South Dakota, and the heavy silt loads carried during run-off periods.

## Forecast

Attainment of fishable-swimmable quality at low flow will depend on upgrading of South Dakota discharges, particularly at Sioux Falls. Solving the high flow silt problem will require extensive nonpoint source controls, and attainment of nonturbid low solids conditions is questionable.

## Data Needs

### Quarterly Monitoring Stations

The existing station monitors nearly all of the basin, is located at a USGS flow gaging station, and should be retained in the network at the present site. A station near the Minnesota border would also be desirable in order to define the water quality flowing into the Iowa reach.

### Intensive Surveys

Past surveys have adequately identified the existing water quality problems, so need for additional data is not urgent. A survey should be conducted after the Sioux Falls treatment facilities are completed, but since the existing data is several years old, consideration should be given to conducting an interim survey, perhaps in conjunction with a Rock River survey.

## Treatment Facility Status

The only continuous discharge treatment facilities on the Iowa side (at Hawarden and Akron) were upgraded prior to 1974 and there are at this time no additional major treatment needs. Minor corrections are needed at the Akron plant in order to meet secondary treatment requirements, but the Iowa-side point sources are not causing significant water quality degradation.

## ROCK RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity and suspended solids, spring | High algal populations, summer | High chlorides below discharges at low flow | DO depressed during low flow under ice cover | Fecal coliform violations near point sources in winter |

Fixed Quarterly Monitoring Stations 1975-1976

At Mouth

Elevated values: fecal coliform (5100/100 ml), suspended solids (800 mg/l), turbidity (320 JTU). DO was well below saturation in winter (35-48% saturation) and supersaturated in summer. Barium, chromium, copper and zinc were detected, but below standards limits.

Intensive Surveys

January 1977 - Very low stream flow, (near) 7 day $Q_{10}$.

This winter survey, performed during almost complete ice cover, indicated stream quality to be poor below the major discharges, but rapid recovery was noted downstream. Fecal coliform and ammonia violations were found below the cities of Rock Rapids and Rock Valley. Specific conductance, TDS, soluble phosphate, chloride and COD levels were also increased over upstream values. TDS and ammonia background concentrations coming from Minnesota were higher than expected. Conditions similar to those on the Rock were found on two tributaries; the Little Rock river and Otter creek. Both the tributaries recovered to good quality before entering the Rock river.

September 1976 - Low stream flow, (10) x 7 day $Q_{10}$

Water quality was good at the time of this survey (warm water, low flow conditions). Moderate increases in specific conductance, ammonia, soluble phosphate and chloride were detected in the immediate vacinities of the major discharges, but no values exceeded standards limits. It can be assumed that a large algal population, indicated by supersaturated DO values over the entire reach (124 - 150% of saturation), was acting to overshadow the effect of the waste discharges on DO. Reduced DO levels could be expected at night, however. Water quality conditions on the Little Rock river and Otter creek were similar to those on the Rock river. Water quality entering the main stem from both tributaries was good.

## Conclusion

Very low flows occur in the Rock, during which water quality is adversely affected in the vacinities of the discharges. Despite the waste discharges and low flows, however, the river during these surveys recovered quickly. Intensive survey data give no information on nonpoint pollution, but quarterly monitoring data indicate that some problems of this type may exist during high springtime flows.

## Forecast

The basin plan for the Rock calls for more stringent than secondary treatment for the continuous discharges in the basin, which should permit attainment of fishable-swimmable water quality at all flows. Because of high silt loads associated with high flows in spring, attainment of year round nonturbid, low solids conditions will be difficult.

## Data Needs

### Quarterly Monitoring Stations

The present station site is too far downstram to adequately assess local impacts of the point source wastes. The station should be retained in the network, but consideration should be given to moving it upstream to the USGS flow measuring station at Rock Valley to give better correlation of water quality and flow data.

### Intensive Surveys

Another intensive survey, combined with accurate flow measurements, should be performed during winter drought flows in order to further define the recovery capacity of the river. An additional survey should be scheduled after the new treatment facilities are completed.

## ROCK RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | |
|---|---|
| NONE | 1974, 1975, 1976, 1977 |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| Rock Rapids | 320 | 160 | $1,130,500 |
| Rock Valley | 250 | 160 | 1,150,000 |
| Sibley | 1,000 | 230 | 2,000,500 |
| TOTAL | 1,570 | 550 | $4,281,000 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## FLOYD RIVER and TRIBUTARIES

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity and suspended solids. Extensive channelization. | Abundant nutrients | High chlorides and total dissolved solids. | Oxygen demanding organic loads evident. | High point source fecal coliform. Pesticides have been detected. |

Fixed Quarterly Monitoring Station 1975-1976

Above Sioux City

Elevated values: fecal coliform (15,000/100 ml), BOD (17 mg/1), COD (270 mg/1), TDS (2700 mg/1), turbidity (540 JTU). D.O. was low in winter and supersaturated in summer. Barium, chromium, arsenic, zinc, nickel, and copper were detected, but below standards limits.

Intensive Surveys

September 1976 - moderately low stream flow, (10) X 7 day $Q_{10}$

The upper two-thirds of the basin was found to be heavily loaded by point source organic wastes. From Sheldon in the far upper reach to below LeMars, water quality was characterized by high fecal coliform levels and elevated values for BOD and ammonia. The ammonia levels were, with one exception (8 mg/1), not higher than the standard, but fecal coliform was consistently above standards limits. Upper reach dissolved oxygens were found to be on the order of 5 mg/1, and increased from upstream to downstream during this period of high photosynthetic activity. However, the low upstream values suggest that wintertime ice cover conditions could result in a serious dissolved oxygen sag. Of the Floyd River tributaries, the Little Floyd River (below Sanborn), Deep Creek (below Remsen), and West Branch Floyd River (below Boyden and Sioux Center) were sampled and found to be carrying high BOD, ammonia, fecal coliform, and TDS concentrations. At the mouth, however, the West Branch Floyd had improved considerably over upstream conditions, because of instream water quality recovery phenomena, and had little impact on the Floyd. Similarly, the lower reach of the Floyd was much improved over upper reaches, and at these flow rates and open water conditions, was of acceptable quality. A survey of aquatic organisms showed much the same picture as the chemical and bacteriological data. Low numbers of organisms were found in the upper reaches, and the communities were characterized by predominance of pollution tolerant forms or absence of intolerant forms. In the lower reaches, there was a more diversified community dominated by clean water organisms.

## Conclusion

The Floyd has been considered for many years to be one of the poorer water quality streams in Iowa, and that judgement was verified by this survey. The historical record shows that there has been some water quality improvement since the 1950's (after several municipal and industrial pollution control facilities were constructed) but there is certainly evidence of need for further point source improvement. Because of low stream flow and nonrunoff conditions, the current data cast little light on the nonpoint source problem. The river, however, has been straightened and channelized throughout much of its length, soil conditions in the basin are conducive to erosion, and historical data documented in the 1975 305(b) Report show that it carries heavy silt loads. Low flow conditions are dominated by the adverse effects of point source loads from wastewater treatment facilities at Sheldon, Hospers, Orange City, and LeMars on the main stem, and Sanborn on the Little Floyd River, Remsen on Deep Creek, and Boyden and Sioux Center on the West Branch Floyd.

## Forecast

The basin plan for the Floyd calls for more stringent than secondary treatment for the discharges in the basin, most of which were identified as problem sources in the September 1976 survey at their present level of treatment. The basin has been mathematically modeled and waste load allocations set to meet water quality standards at drought flow, so implementation of the basin plan should permit attainment of the organic chemical and bacteriological criteria for fishable-swimmable water quality. Solving the silt load problem will, however, require extensive nonpoint source control, and attainment of nonturbid low solids conditions is doubtful.

## Data Needs

### Quarterly Monitoring Stations

The present station site is too far downstream to adequately assess the point source waste impacts, so it should be considered to be a low priority station. Consideration should be given to moving the site upstream to Merrill or the USGS gaging station at James, or preferably, adding new stations on the West Branch Floyd and the main stem above the fork. Pesticide sampling coverage at the lower reach station should be increased to improve the data base for silt load versus water quality correlations.

### Intensive Surveys

A winter survey would be desirable, but probably of low priority since existing data are sufficiently suggestive of serious cold weather and ice cover impacts to document the need for treatment plant upgrading. An intensive survey should be scheduled after the major discharge improvements have been completed.

## FLOYD RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

NONE 1974, 1975, 1976, 1977

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Hospers | 258 | 98 | $ 865,000 |
| LeMars | 1,416 | 546 | 1,000,000 |
| Orange City | 912 | 258 | 747,000 |
| Remsen | 264 | 108 | 285,000 |
| Sheldon | 540 | 456 | 3,036,000 |
| Sioux Center | 990 | 696 | 2,868,000 |
| TOTAL | 4,380 | 2,162 | $8,801,000 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## LITTLE SIOUX RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| Extremely high turbidity and suspended solids, lower reaches. | High nutrients increasing with flow. | High TDS from point sources, at low flows. | High BOD load due to major point sources. | High fecal coliform, point & non point; frequent pesticide detections. |

Fixed Quarterly Monitoring Stations 1975-1976

Above Spencer

Elevated values: dissolved iron (260 mg/l), turbidity (53 JTU), BOD (20 mg/l). COD (90 mg/l), Turbidity (100 JTU). Zinc, copper, and barium were detected, but were below standards limits. DO was below saturation in winter (7.2-10 mg/l), but varied between supersaturation (18.5 mg/l) and standards level (5.4 mg/l) in summer.

Near Turin

Elevated Values: total solids (3175 mg/l), Fecal Coliform (94,000/100 ml), Dissolved Iron (210 mg/l), COD (242 mg/l), turbidity (135 JTU). DO was low in August (5.6 mg/l). Chromium, barium, lead, zinc, nickel were detected but below standards limits.

Intensive Surveys

August and October 1975 - average stream flow, (20-30) x 7 day $Q_{10}$

Contrary to the historical record, water quality observed during these average stream flow surveys was good. Suspended solids, total dissolved solids, and turbidity were all at relatively low levels. Pesticides were low (at the lower limits of detection) and of the heavy metals, only barium, nickel and zinc were detected, and these were well below standards limits. Overall, fecal coliform levels were also below standards. Although there was at that time no decrease in oxygen demanding point source loads, photosynthetic action kept dissolved oxygen levels near saturation, at least during daytime hours.

May 1976 - above average stream flow, (100) x 7 day $Q_{10}$

The effects of nonpoint runoff were more typically evident. Turbidity, suspended solids, and total dissolved solids were well elevated, particularly in the lower reaches (below Cherokee) where highly erodible soil conditions come into play. High total phosphate and COD varied directly with turbidity, thus appear to be interrelated. Algal activity was reduced as a result of the high turbidity, so dissolved oxygen levels were lower than observed during the 1975 survey, but were well above the standard. Fecal coliform levels were also high, again a sufficiently significant distance below the major point source discharges to suggest that they are of nonpoint source origin.

## Conclusion

Conditions observed at these average to above average stream flows do not accurately depict either the nonpoint source problem associated with runoff from agricultural land, or the oxygen demanding impacts of the point source organic loads. The May survey does, however, suggest that runoff is still a problem as concluded in the 1975 305(b) report. It is not surprising either that the impacts of point source loads are masked by dilution and photosynthetic effects during average or above average stream flows. These impacts assert themselves at low flows, and particularly under ice cover, and that problem is documented in the 1975 305(b) report. Since that report, however, a new and upgraded City of Cherokee domestic waste treatment plant has gone on line, and future low flow surveys should show improved water quality. Major discharges from the Iowa Great Lakes Sanitary District, City of Spencer, and Wilson & Co. (Cherokee) waste treatment facilities still need to be upgraded before low flow water quality can be considered adequate.

## Forecast

Dissolved oxygen, nutrients, and health related criteria for fishable swimmable water quality should be achieved by completion of the planned waste treatment facility projects, and some yet undefined level of non-point source pollution control. Pronounced improvement in turbidity levels will be more difficult, particularly in the highly erodible soil areas in the lower reaches.

## Data Needs

### Quarterly Monitoring Stations

Data from both stations correlate reasonably well with the intensive survey data. The Turin station monitors nearly the entire basin, including the West Fork Little Sioux and the Maple Rivers, so should remain in the network at the existing site. Consideration could be given to moving the Spencer station downstream to better monitor point source effects. Preferably, however, a mid-reach station could be added to the network, perhaps near Washta.

### Intensive Surveys

Further intensive surveys will not be needed until the remaining major treatment plant upgrades go on-line, after which low flow data should be collected to determine the extent of water quality improvement.

## LITTLE SIOUX RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. Before | Discharge P.E. After | Construction Cost |
|---|---|---|---|
| **1974** | | | |
| Peterson | 308 | 75 | $147,000 |
| Quimby | 159 | 39 | 106,000 |
| Smithland | NPETP | 55 | 90,000 |
| **1975** | | | |
| Cherokee | 1,038 | 240 | 1,562,000 |
| Pierson | 153 | 57 | 102,000 |
| **1976 & 1977** | | | |
| NONE | | | |
| TOTAL | 1,658 | 466 | $2,007,000 |

## TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. Current | Discharge P.E. Required | Projected Cost Construction |
|---|---|---|---|
| IGLSD | 2,448 | 1,074 | $8,354,000 |
| Spencer | 6,174 | 1,278 | 7,392,000 |
| Cherokee (Industrial Waste) | 1,604 | 1,140 | - - - |
| TOTAL | 10,226 | 3,492 | $15,746,000 |

IGLSD = Iowa Great Lakes Sanitary District
NPETP = No Prior Existing Treatment Plant
PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## MAPLE RIVER AND TRIBUTARIES

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity in loessial soils reach | Elevated nutrients from point sources | Alkalinity and hardness, increasing toward mouth | Oxygen demanding sources evident. Discernible D.O. sag | Point source fecal coliform levels exceed standards |

Fixed Quarterly Monitoring Stations

None

Intensive Surveys

July 1974 and Jan. 1975 - avg. and low stream flows, (25 and 3) x 7 day $Q_{10}$

This initial summer/winter survey suggested that point source caused water quality problems existed in the upper reaches, below Aurelia and Ida Grove. Ammonia nitrogen and fecal coliform levels were elevated, although not severly so. BOD was also elevated during the summer part (probably a measure of algal activity) but dissolved oxygen levels were good. High turbidities were observed in all but the uppermost reaches, because of the effect of the highly erodible loessial soils in the basin. The aquatic macroinvertibrate community was surveyed and showed indications of a generally acceptable water quality at these flows, although the river offers poor habitat for aquatic life (channel straightening and shifting bottom conditions) and at some stations, few organisms were found. It was concluded that additional sampling was needed to adequately define the water quality.

January 1976 - moderately low stream flow, (8) x 7 day $Q_{10}$

This survey confirmed the point source water quality problems suggested in 1974 and 1975, and furthermore, that serious degradation was being caused by poor water quality in the tributaries Little Maple River below Alta and Odebolt Creek below Odebolt and Ida Grove. Fecal coliform and ammonia levels were elevated, with several fecal coliform standards violations and an ammonia standards violation (on Odebolt Creek). Dissolved oxygen was also depressed, and at several stations, was below standards. The D.O. sag continued into the lower reaches, which indicates that the oxygen demand is not satisfied until the water reaches and probably impacts the Little Sioux River. Since this was a period of minimal runoff, the poor water quality was attributed to point sources. This was further substantiated by concurrent findings of good to excellent water quality in the Maple River tributaries Silver Creek, Elk Creek, and Battle Creek, which do not receive point source wastes.

## Conclusion

Considerable improvement in waste treatment facilities is needed. The basin plan for the Maple calls for upgrading of existing facilities to better than secondary treatment, to meet water quality standards at drought stream flows. Although Ida Grove is the only major discharge, minors at Aurelia, Alta and Odebolt, which were identified as problem sources by these surveys, are under permit compliance schedules for upgrading. These surveys did not provide sufficient data to accurately determine the nonpoint source problem, but the character of the soil in the lower reaches and the finding of nonpoint source problems in the Little Sioux below the Maple suggest that there is also need for some nonpoint source control.

## Forecast

Wasteload allocations set out in the basin plan were derived from water quality mathematical modeling designed to meet water quality standards. Implementation of the basin plan will therefore permit attainment of fishable-swimmable water quality criteria. It is questionable, however, whether nonturbid conditions can be met, because of nonpoint source silt loads.

## Data Needs

### Quarterly Monitoring Stations

The Turin station on the Little Sioux monitors impacts from the Maple. However, Maple River water quality is of sufficient significance that additional fixed stations would be desirable, probably in the Castana area and immediately above Odebolt Creek.

### Intensive Surveys

A high stream flow runoff affected survey would also be desirable. Little Sioux river data, however, could probably be extrapolated to the Maple, and further intensive surveys would have low priority until point source improvements are completed and an after cleanup survey is warranted.

## MAPLE RIVER

### TREATMENT FACILITY UPGRADES COMPLETED

| | Discharge P.E. | | Construction Cost |
|---|---|---|---|
| | Before | After | |
| | 1974 | | |
| Galva | 138 | 88 | $149,000 |
| | 1975 | | |
| | NONE | | |
| | 1976 | | |
| | NONE | | |
| | 1977 | | |
| | NONE | | |

### TREATMENT FACILITY UPGRADES NEEDED

(Major Discharges)

| | Discharge P.E. | | Projected Cost Construction |
|---|---|---|---|
| | Current | Required | |
| Ida Grove | 1,002 | 222 | $1,500,000 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

## BOYER RIVER

| Physical Modification | Eutrophication Potential | Salinity, Alkalinity, Acidity | Oxygen Depletion | Health Hazard |
|---|---|---|---|---|
| High turbidity in spring. | High nutrient levels. | Moderate TDS and alkalinity | Oxygen demanding loads evident. | High fecal coliform below Denison. |

Fixed Quarterly Monitoring Stations 1975-76

Near Missouri Valley

Elevated values: ammonia nitrogen (2.5 mg/l), fecal coliform (67,000/100 ml), turbidity (280 JTU). DO was moderately below saturation in winter (10.3 mg/l) and above saturation in summer (9.5 - 13.6 mg/l). Barium, chromium, copper, lead and zinc were detected, but below standards levels.

Intensive Surveys

September 1976 - low stream flow, (7) X 7 day $Q_{10}$

This survey showed that discharges in the Denison area have significant impact. Total soluble phosphate, BOD, nitrate and COD increased at Denison, then gradually decreased downstream. Ammonia nitrogen increased from less than 0.01 mg/l above Denison to 6.2 mg/l below, but then decreased rather rapidly downstream. Supersaturated dissolved oxygen levels the entire length of the stream indicate that the survey was conducted during a period of high photosynthetic activity, and that the oxygen demanding effects of the waste loads were being effectively masked. Nocturnal DO depression could be expected, however.

January 1975 - normal stream flow, (22) X 7 day $Q_{10}$

This survey, performed while the entire river was covered with a ten to twelve inch thickness of ice, showed that significant changes in water quality occurred in the Denison area. Fecal coliforms increased from 60 to 8,000/100 ml. Ammonia nitrogen increased from 0.27 to 8.0 mg/l then gradually decreased downstream, but never fell below 3 mg/l over the remainder of the stream. Total phosphate, chloride, turbidity, BOD and TDS also increased through the Denison area. The effect of the Denison wasteloads on DO was seen several miles downstream, where a low value of 4.2 mg/l was reported. Effluent samples obtained from the Denison municipal and Iowa Beef Processors (IBP) plants showed that a strong wasteload was being discharged at the time.

## Conclusion

Poor water quality has been found in the Boyer during both summer and winter surveys. The major problems are the Denison area discharges. Because of the highly erodible loessial soils in the drainage area, it can be expected that nonpoint problems also exist, and the quarterly monitoring data tend to support that expectation.

## Forecast

The basin plan calls for more stringent than secondary treatment at Denison. Current plans are for a new regionalized treatment plant for municipal domestic waste and industrial waste from IBP and Farmland Foods. The basin has been mathematically modeled with wasteload allocations set to meet standards at drought flow, so implementation of the basin plan should permit attainment of fishable-swimmable criteria at low flows. Due to the highly erodible soils in the area, improvement in turbidity levels at high flows will be more difficult, and will probably require extensive nonpoint source control.

## Data Needs

### Quarterly Monitoring Stations

Data from the quarterly monitoring station correlate reasonably well with the intensive survey data. The station near Missouri Valley monitors nearly the whole basin, so should remain in the network at the existing site. A mid-reach station and a station above Denison would also be desirable. The three reaches are different in charactor, so the additional sampling stations would better define the quality of the river.

### Intensive Surveys

Recent surveys adequately document existing point source problems. Further intensive surveys can be delayed until after the treatment improvements are completed at Denison, at which time data should be collected during low flow to determine the extent of improvement.

# BOYER RIVER

## TREATMENT FACILITY UPGRADES COMPLETED

None 1974, 1975, 1976, 1977

## TREATMENT FACILITY UPGRADES NEEDED
(Major Discharges)

| | Discharge P.E | | Projected Cost |
|---|---|---|---|
| | Current | Required | Construction |
| Denison | 4,200 | 1,650 | $3,333,400 |
| Farmland Foods @ Denison | 2,600 | * | * |
| Iowa Beef Processors @ Denison | 1,000 | * | * |
| Missouri Valley | 600 | 40 | 389,900 |
| TOTAL | 8,400 | 1,690 | $3,723,300 |

PE = Population Equivalent - An amount of organic waste which is equivalent to that in the domestic wastewater generated by one person in one day.

* To be included in Denison Regional Plant.

# Section II.

## Agricultural Nonpoint Source Problems

### Forward

Past sampling efforts in Iowa have been directed primarily toward determining the effects of point source polltion on the streams during low flow and adverse weather conditions. Although Section I did identify nonpoint pollution as a contributor to water quality violations on certain segments, little data exists to evaluate nonpoint pollution effects on all stream segments, or on a quantitative basis. A general overview of the non-point pollution problem is presented in this section.

Through the 208 planning efforts, greater emphasis is being put on nonpoint pollution. The "Interim Output for Section 208 Agricultural Nonpoint Source Planning" which was submitted to EPA recently, provides a mechanism for controlling agricultural nonpoint pollution. When this program is implemented, a more complete assessment of nonpoint pollution from agriculture can be made.

Because of the importance of agriculture in Iowa and the high pollutant loadings contributed to streams by agricultural nonpoint pollution, it has received greater emphasis than other types of nonpoint pollution, such as urban runoff, construction, residual waste disposal, etc. These will receive further study when the time and resources are available. This activity is being incorporated in the 208 planning process.

# SECTION II

# AGRICULTURAL NONPOINT SOURCE PROBLEMS

## Introduction

Water pollution sources can be grouped into two broad categories - point and nonpoint. Past control and abatement efforts at both state and national levels have focused primarily on point source pollution - pollution which can be attributed to an identifiable source, such as a municipal wastewater facility or an industrial discharge. Control of pollution from nonpoint sources has received little attention.

Iowa's Statewide 208 Water Quality Management Planning Process devotes considerable work toward development of a nonpoint source control plan. Because agricultural cropland is considered to be Iowa's most significant nonpoint pollution source, the initial nonpoint planning efforts have concentrated on developing a nonpoint source control plan for cropland. Future 208 planning will assess the pollution caused by other nonpoint sources and will develop appropriate control plans for such activities.

## Nonpoint Pollution Identification

As published in 41 Federal Register, p. 7964, (February 23, 1976), nonpoint pollution sources are characterized by three elements: "First, the pollutants are conveyed by water, the source of which is uncontrolled by any person; that is, the the water pollution results from precipitation, natural flooding or snowmelt. Second, the pollution itself is not traceable to a discrete, identifiable source such as a facility or industrial process. Third, the control of nonpoint source water pollution is generally best achieved by planning and management techniques rather than by end-of-pipe treatment to remove pollutants. End-of-pipe treatment, designed to meet specified effluent limitations, is often inappropriate for pollution control for nonpoint sources. Instead, planning and management techniques control and abate the nonpoint pollution before it is created and thus effectively limit and prevent pollutants from reaching navigable waters."

Nonpoint pollution can result from a number of activities, including mining, silviculture, cropland and animal agriculture, and construction activities. Urban stormwater and snowmelt runoff, stream bank and channel erosion, and land disposal of wastes can also contribute to nonpoint pollution. Pollutants generated include sediment, nutrients, bacteria, organic matter, toxic metals, and pesticides.

## Transport Processes

The movement of potential pollutants from the land surface to streams is an important consideration in planning for agricultural nonpoint souce controls. The transport processes (direct runoff, sediment movement, and percolation) are largely controlled by natural conditions such as weather and land characteristics, however, man influenced management and land use conditions also affect these processes. An understanding of these relationships and the behavior of chemicals after land application is necessary before control practices can be formulated. Water movement processes and amounts must be known before the transport of agricultural chemicals or nutrients from land areas to surface waters can be described or determined. Surface runoff may carry chemicals in solution, in suspension, or adsorbed to sediment or organic matter. Subsurface runoff or ground water inflow will carry only soluble chemicals that are not strongly attached to soil particles. Due to the long travel time involved in ground water movement, chemicals which have short persistence may not pose a pollution hazard when ground water reaches surface waters.

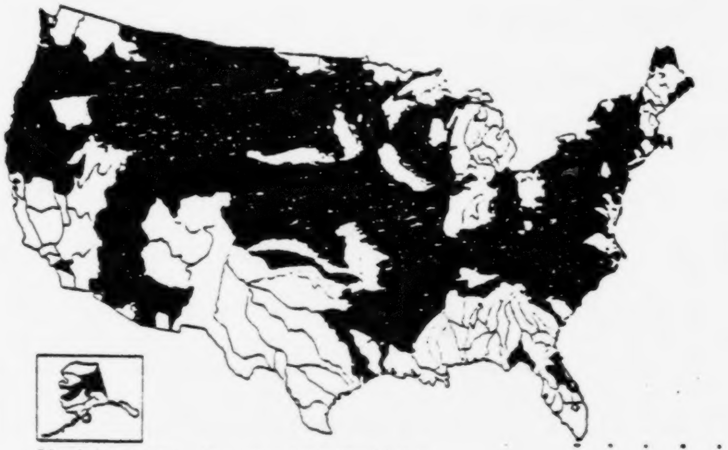
Much of the research information on agricultural sediment and chemical movement has evolved from the premise that soil should be kept in place. Not all sediment and chemicals which initially move "on the land" reach surface waters, nor is there any predictable length of time involved in this transport. Potential pollutants may be trapped or delayed enroute. Dilution by uncontaminated runoff may also occur. Therefore, complete control of movement of potential pollutants within a field area may not be necessary to achieve an acceptable level of pollution control. For pollution to occur, these pollutants must be transported from fields to surface waters.

## Pollutants of Concern in Iowa

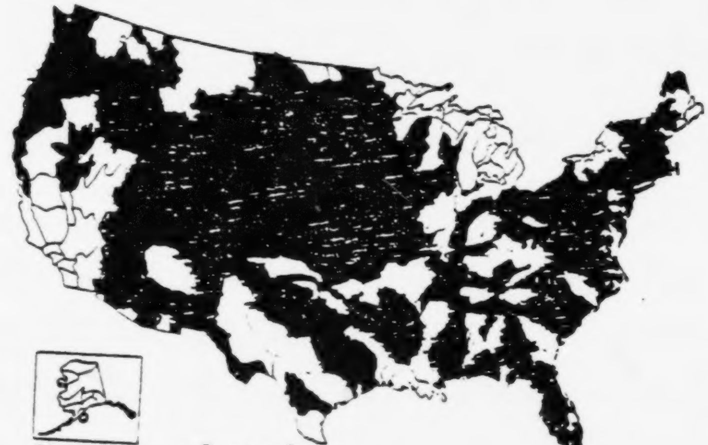
Several national studies have identified nonpoint source pollutants affecting Iowa's waters. EPA's Office of Research and Development has conducted studies[1] which found higher sediment and nutrient concentrations in streams draining agricultural lands than streams draining range lands, forest lands, or urban land areas. Cropland ranks first in percent of sediment yield by source and in amount of relative total erosion[2]. Because 75% of Iowa's land area is cropland, high sediment and nutrient loadings can be expected in Iowa's surface waters.

In the "Environmental Impact Statement (EIS) on the Draft Rural Clean Water Program"[2], the Soil Conservation Service identified nonpoint source pollutants considered to have a significant impact on Iowa waters. In addition to sediment and nutrients, the EIS identified suspended solids, bacteria, and pesticides as pollutants of concern. (See Figure II-1)

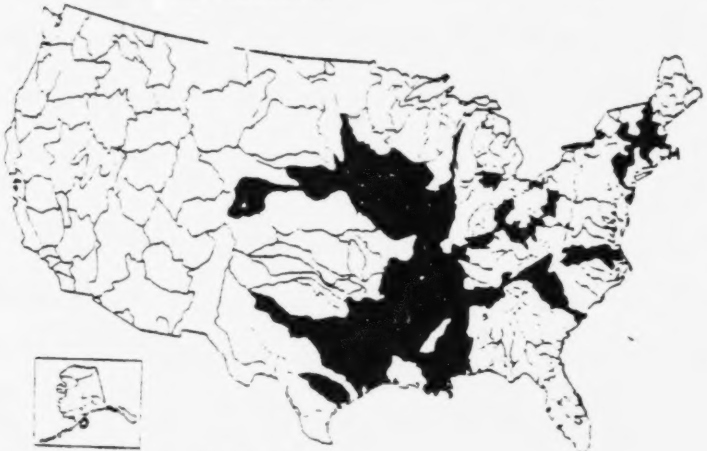
Analyses of Iowa water quality data, water quality surveys, and the "Technical Assessment of Nonpoint Pollution in Iowa" verifies that sediment, nutrients, pesticides, bacteria and organic matter are nonpoint pollutants which signifi-


* In whole or in part

Suspended Solids


* In whole or in part

Bacteria



Pesticides

Figure II-1 Extent of Specific Nonpoint Source Pollutants

Source: EPA. Unpublished draft, National Water Quality Inventory, 1977 Report to Congress cantly affect Iowa's water quality[12]. A general explanation of the water quality impacts of each pollutant and the land related factors is given below.

## Sediment

Sediment in streams and lakes causes two major types of water quality problems - the problems caused by the sediment itself and the problems created by pollutants adsorbed to sediment.

Sediment can affect the uses of a stream or lake and can affect aquatic life as well. Sediment build-up in lakes, reservoirs and streams reduces the capacity of the lakes and clogs stream channels. Spawning and feeding areas for fish may be covered, thereby reducing fish populations. Sediment can also cover or reduce the desirability of recreational areas, thereby affecting public use of the waters.

High turbidity may cause fish kills by clogging the gills with sediment particles. High turbidity may also reduce photosynthesis by aquatic plants. Treatment of highly turbid water for use as a public water supply may increase treatment costs significantly.

Sediment is one of the primary transport mechanisms for pollutants such as pesticides and the nutrients, nitrogen and phosphorus. Once carried into waters, these pollutants can adversely impact water quality.

The relationships of sediment attached nitrogen and phosphorus to dissolved chemicals in surface waters is not well understood. Generally, sediment found in surface waters resembles the soils from which it came, but the sediment normally has higher silt, clay, and organic matter content. Sediments delivered to surface waters often have higher concentrations of nitrogen and phosphorus than do the original soils (enrichment process). Sediment, on the other hand, also acts as a "scavenger" and removes soluble phosphorus from waters by phosphorus attachment to the sediment particles. Even though sediment contributions to stream systems may be high, accurately predicting its pollution potential in surface waters is difficult.

The Universal Soil Loss Equation provides a reasonable long term estimate of the annual sheet and rill erosion for field areas[11]. However, sediment delivery rates and estimates of channel and gully erosion, must be applied to these estimates to predict total sediment yield to surface waters. Estimating sediment yields using the sediment delivery ratio is not a precise science and varies with relief, drainage area, topography, runoff, drainage densities, sediment characteristics, etc. Therefore, accurately predicting the amount of sediment delivered to a stream system from a particular land area is difficult.

## Nutrients

Nutrients are chemicals that are necessary for growth and development of living organisms. Even though these nutrients are necessary for development of living organisms, they may become a source of pollution when allowed to move in excess to streams and impoundments. Of the nutrients, nitrogen and phosphorus compounds are considered to have the greatest pollution potential. Copper and zinc compounds are classified as toxic elements and may also pose a pollution threat to some surface waters. Sources of nutrients include organic matter (including plant residues), soil, commercial fertilizer, and animal wastes.

Nutrient pollutants are of concern because of their potential toxicity to humans and animals, and their role in accelerating the eutrophication rates of lakes and streams. At high levels, nitrites, (and to a lesser extent, nitrates) can cause methemoglobinemia in infants and young livestock by interfering with oxygen transport in the blood[14]. The maximum allowable nitrate level in public water supplies has been established at 10 milligrams per liter nitrate nitrogen.

While eutrophication of surface waters is a natural phenomenon, the introduction of high levels of nitrogen and phosphorus into the water can speed up the growth of aquatic plants. High nutrient levels may cause algal blooms to become a particular problem. Algae can be a nuisance to those using the water for recreation or drinking, and when algae die off, taste and odor problems may occur. In addition, algal decomposition may lower dissolved oxygen levels to the point where fish kills result.

Iowa soils do not naturally contain adequate levels of many nutrients required for satisfactory crop yields. Therefore, it is customary to apply commercial fertilizers to supply nutrients such as phosphorus and nitrogen. If these nutrients subsequently reach surface waters, pollution may result. Pollution resulting from application of nitrogen and phosphorus fertilizers is related to application rates, methods, and timing. Application rates will affect the amount of material available for transport and the type of transport process which may occur. Similarly, the timing of the fertilizer application influences the degree to which the crop utilizes the nutrients and consequently the amount available for transport to surface waters.

Pollution of streams and lakes by nitrogen compounds is a prime concern in developing an agricultural nonpoint source control program in Iowa. Recent studies generally show higher inorganic nitrogen contents attributed to nonpoint sources in streams in the Corn Belt States than in any other area of the U.S.[1] These inorganic nitrogen pollutants may reach surface waters through transport by sediment, surface runoff, or subsurface runoff.

The amounts of erosion (sediment movement) and the total nitrogen loss vary markedly with tillage systems and soil conditions. The nitrogen load associated with sediment is related to erosion, soil chemistry, and the organic matter of the soil. Data indicates that total nitrogen and sediment losses to waters are directly related and that tillage systems and control practices which limit erosion and sediment movement also reduce nitrogen losses[14]. In terms of total losses of nitrogen, the amount lost with sediments is usually greater than that dissolved in runoff solution (dependent upon amount of soil erosion)[14]. However, the availability of this sediment attached nitrogen and the potential adverse effects on water quality are much less than with the readily available soluble forms.

Nitrogen in the ammonium form ($NH_4+$) is adsorbed and held as an exchangeable cation and may be transported with suspended clay particles. Surface applications of ammonium nitrate fertilizers or ammonium nitrogen present in manures or crop residues on the soil surface can be sources of nitrogen for transport by this means. However, evidence indicates that the amount of nitrogen transported in this form by runoff waters is minimal[14].

The potential for nitrate-nitrogen ($NO_3$-N) leaching is a major concern in regard to nitrogen pollution of Iowa's surface waters. $NO_3$-N is very water soluble, is not adsorbed to sediment and is often a primary form of nitrogen transported with runoff. Nitrates in soils which occur from mineralization of nitrogen in soil organic matter, mineralization of nitrogen in crop residues and manures, and applications of commercial fertilizers, may contribute to the nitrate levels in these waters.

There is an inclination to relate the high levels of nitrogen fertilizers applied in the last 20 years to the high nitrate concentrations in surface waters, and place the major responsibility for this nitrogen pollution on fertilizers.

However, available data does not justify nor refute this conclusion, since adequate data on nitrate levels in streams is not available for the period of time prior to the increase in fertilizer use[14].

While there is some danger of nitrogen loss with runoff from surface applied fertilizers, conditions generally favor movement of soluble nitrogen into the soil before surface runoff begins. Also, the extent of soil incorporation will affect the amounts of water soluble nitrogen available for transport with surface runoff. Since many Iowa soils are medium textured and have rapid infiltration rates, these soils allow most water soluble nitrogen to infiltrate into the soil prior to runoff events (exceptions to this are heavy clay soils and frozen soils).

The affects of tile drainage on nitrogen pollution of waters involves the nutrient ions $NO_3$ and $NH_4$. Data from fairly level, tile drained watersheds indicates that from 30 to 80% of the total water drainage in these watersheds is contributed by tile flow[15]. Average concentrations of $NO_3$-N may be relatively high and in heavy rainfall periods may equal the losses from erosion processes. There is increasing evidence that high fertilization is associated with these high $NO_3$-N concentrations. Areas having high flows through tile drainage should, however, have less nitrogen losses through surface runoff. Also, the increased percolation of water through the soil may allow more ions to be adsorbed to soil particles. Therefore, in judging the overall impact of tile drainage on water quality, the increased amounts of nitrogen lost with tile effluent must be compared to the potential decreased losses transported by erosion and surface runoff.

Since phosphorus in streams and impoundments is often the limiting factor in algae growth, it is important as a potential nonpoint pollutant. Since natural sources supply phosphorus to the soil very slowly and increased cultivation has potentially depleted this natural supply, significant quantities need to be applied as fertilizers to maintain profitable crop production.

Loss of phosphorus materials to stream systems may occur in two ways: 1) In solid form adsorbed to soil particles or as undissolved fertilizer particles, or 2) as dissolved phosphates in solution. Soluble inorganic phosphorus in surface runoff usually represents only a small fraction of the total phosphorus lost to surface waters. Most evidence suggests that subsurface and ground water movement of phosphorus is not a major source of stream pollution (chances of contributions of phosphorus to ground water would be greatest on well-drained, coarse textured soils receiving large amounts of fertilizer and water)[14]. The phosphorus content of tile drainage water from several sites in Iowa indicate that losses by this method are also quite small[15].

Phosphorus is generally quite immobile in the soil because of its high degree of reactivity with soil colloids and certain cations to form relatively insoluble salts. Because of this tendency to remain in relatively insoluble forms near the point of application, phosphates are readily susceptible to losses with eroded soil. Phosphorus losses are usually highly correlated with the quantity of soil lost[13].

Erosion removes the topsoil, which generally contains the highest concentrations of phosphorus. The finer and lighter particles which provide the high adsorptive sites for phosphorus are easily carried with runoff and are the last to be deposited as sediment. Consequently, the sediment that is transported to surface water is usually richer in phosphorus than the soil from which it evolved. This enrichment ratio, as it is referred to, varies but is often in the range of 2 to 6 times that of the original soil[13].

The amount of phosphorus attached to soil particles and suspended in runoff may indicate the potential amount available for stream pollution. However, this amount gives little indication of the amount of material which is immediately available for aquatic plant growth. Estimates suggest that the amount immediately available may be less than 5 to 10% of the total phosphorus delivered[14]. Little is known about the rate at which the remainder becomes available.

Copper and zinc appear to be the only other nutrients which may pose a potential pollution threat. Limited information exists on the transport of these elements in runoff water. The factors that affect soil erosion rates are also likely to affect the transport of these materials.

## Pesticides

The widespread use of pesticides and the variety of pesticides used makes it difficult to generalize on pesticide impacts on water quality. Some pesticides degrade very rapidly, while others may persist in the environment for a long time. In addition, synergistic effects may occur in the presence of two or more pesticides.

High pesticide levels in water can result in fish kills, have pathological effects on fish, or cause changes in reproductive or behaviorial patterns of aquatic organisms[14]. Some pesticides, particularly insecticides, may concentrate in aquatic plants and animals and thus enter the human food chain. Some insecticides may also cause odor and taste problems in water.

While lethal concentrations of selected pesticides have been determined for some aquatic species and wildlife, the impacts of chronic and long-term exposure are not known. Since many of the pesticides currently in use have only recently been developed, little data on their water quality impacts exists. Although pesticides are a recognized problem, further investigations will be required to clearly define the extent that pesticides effect water quality.

Predicting the amount of pesticide that reaches a stream or lake is extremely difficult because of the very large number and heterogeneity of the variables involved, and incomplete knowledge of how these variables interact. Information is available on pesticide losses for a limited number of pesticides, a limited number of soils, and a limited number of environmental conditions[13]. This data allows only generalized predictions to be made as to the effects of these variables on pesticide contamination of waters.

The amount, location, and interaction of pesticides in the soil-water-plant system influences the various pesticide transport processes. Application losses, adsorption and attenuation processes such as volatilization, degradation, and plant uptakes are important factors in potential pesticide pollution. Movement by erosion, diffusion, leaching and surface runoff also are important.

An important process affecting the fate of pesticides is the adsorption of the material to different fractions of the soil. This adsorption decreases pesticide volatilization and movement with water, and decreases its availability to plants, insects, and microorganisms. However, pesticide movement with sediment transport is increased. Adsorption to the soil particles is largely determined by the pesticide properties and soil properties such as organic matter, types of clay minerals, pH levels, and soil temperature. Pesticides can be grouped in order of increasing adsorption strengths, and thus decreasing mobility by leaching. (Table II-1)

Table II-1. Soil persistence and adsorption class of pesticides currently used in Iowa[14]

| Pesticide | Approx. Persistence in Soil (wk) | Approx. Solubility (ppm) | Adsorption Class** |
|---|---|---|---|
| carbaryl (Sevin) | 6 to 20 | 40 | II |
| carbofuran (Furadan) | 7 to 54 | 700 | II |
| fonofos (Dyfonate) | 52+ | 13 | II |
| malathion (Cythion) | 1 | 145 | II |
| phorate (Thimet) | 7 to 20 | 50 | II |
| terbufos (Counter) | 23+ | 10 to 15 | II |
| toxaphene | 520+ | 3 | III |
| alachlor (Lasso) | 4 to 8 | 242 | II |
| atrazine (AAtrex) | 8 to 32 | 33 | II |
| bentazon (Basagran) |  | 500 | I |
| bifenox (Modown) | 6 to 8 | <1 | III |
| butylate (Sutan) | 6 to 8 | 45 | II |
| chloramben (Amiben) | 6 to 8 | 700 | I |
| chlorbromuron (Maloran) | 8 to 16 | 50 | II |
| chlorpropham (Furloe) | 12 to 32 | 88 | II |
| cyanazine (Bladex) | 8 to 12 | 171 | II |
| 2,4-D (acid) | 4 | 900 | I |
| 2,4-D (ester) | 4 |  | II |
| dicamba (Banvel) | 12 to 48 | 4,500 | I |
| dinitramine (Cobex) | 12 to 32 | <1 | III |
| dinoseb (Premerge) | 4 |  | II |
| EPTC (Eptam, Eradicane) | 6 to 8 | 370 | II |
| fluchloralin (Basalin) | 12 to 24 | <1 | III |
| linuron (Lorox) | 8 to 16 | 75 | II |
| metachlor (Dual) | 4 to 12 | 530 | II |
| metribuzin (Lexone, Sencor) | 4 to 16 | 1,220 | II |
| paraquat | very long | soluble | III |
| Pendimethalin (prowl) | 8 to 24 | <1 | III |
| profluralin (Tolban) | 12 to 24 | <1 | III |
| propachlor (Ramrod) | 4 to 6 | 580 | II |
| glyphosate (Roundup) |  | 12,000 | III |
| simazine (Princp) | 8 to 32 | 5 | III |
| trifluralin (Trelant) | 12 to 24 | <1 | III |
| vernolate (Vernam) | 4 to 8 | 90 | II |

*Data base for this table includes Weed Science Society of America (1974), Seatz (1977), Laveglia and Dahm (1977), Canadian Department of Agriculture (1968), Helling (1971).

| | |
|---|---|
| **Adsorption Class I | Weakly adsorbed and readily leached in sand soils low in organic matter (1%), but some resistance to movement in other soils. |
| Adsorption Class II | Medium adsorbed with moderate movement in sandy soils low in organic matter (1%), but little or none in other soils. |
| Adsorption Class III | Strongly adsorbed with slight movement in sandy soils low in organic matter (1%), with negligible movement in other soils. |

The persistence of a pesticide indicates the amount of material available for loss over a period of time. This persistence rate is affected by factors such as pesticide degradation rates, volatilization, plant uptake, and movement with sediment and water. Of the organic pesticides, the chlorinated hydrocarbons are the most persistent, the triazine herbicides are the next most persistent, and the remaining groups generally do not persist from one growing season to the next. (See Table II-1) Of the chlorinated hydrocarbons, only toxaphene is currently being used since the banning of DDT, aldrin and dieldrin.

The timing, intensity and amount of rainfall also affect the amount of erosion, runoff and associated pesticide losses. Infiltration will carry certain amounts of pesticides (dependent upon pesticide and soil properties) into the soil, thereby decreasing pesticide availability for overland transport. Losses of many pesticides are most prominent in the period immediately after application, before downward movement of the pesticides from the soil surface occurs. Even though pesticides can leach to the water table under various climatic and soil conditions, pesticides generally do not appear in ground or tile water[15].

Even less data exists on pesticides found in surface waters than on runoff and movement from treated fields. In particular, little is known of attenuation processes that occur as pesticides are transported to the surface waters from land areas. Pesticide levels detected in movement from treated fields can be in the parts per million (ppm) range for herbicides and the organophosphate and carbamate insecticides, while those in surface waters, when detected, are in the parts per billion (ppb) range and lower[14]. Some of this reduction is due to dilution by drainage water. However, reduction may also be caused by attenuation processes between the fields and surface waters. Factors involved include sediment and pesticide trapping and distance between application areas and surface waters.

Estimates in Table II-2 indicate estimated percentages of applied pesticides delivered to surface waters in Iowa. These estimates are based on values of actual runoff losses, knowledge of pesticide-soil-water interactions and judgment of technical personnel involved in pesticide research.

The numbers given are ranges of values expected in most years, with numbers in parenthesis indicating maximum values which may be expected in "worst case" situations. Since these estimates do not consider attenuation processes which may occur between field and surface waters, these values may be high.

Table II-2. Estimated percentages of applied pesticides delivered to surface waters[14].

| Adsorption | % Transported with Water probable range (max)* | % Transported with Sediment probable range (max)* |
|---|---|---|
| I (weak) | 0 - 1 (10) | 0 - 0.1 (1) |
| II (medium) | 0 - 5 (20) | 0 - 1 (4) |
| III (strong) | 0 - 0.5 (2) | 0 - 2 (10) |

*Under very unusual conditions pesticide losses may reach values shown as (max).

### Bacteria and Organic Matter

Bacteria and organic matter are common pollutants resulting from feedlot operations, livestock waste disposal, and cropland runoff. Detrimental effects include odor and taste problems, transfer of disease organisms to animals and humans, and depletion of dissolved oxygen levels in water. Unsightly floating solids or formation of sludge banks may also be a problem.

## Studies Illustrating Nonpoint Pollution in Iowa

In May, 1976, the University Hygenic Laboratory (UHL) conducted a "Water Quality Survey of the Iowa River during a Rainfall Runoff Period"[3]. The chemical, bacteriological, and pesticide data which was collected, and the estimates made on topsoil losses help to illustrate the type of nonpoint source pollution problem in Iowa.

The data from this survey showed a direct relationship between the high volumes of flow from the rainfall runoff and the high levels of nonpoint source pollutants, including turbidity, fecal coliform, total phosphate, COD, organic nitrogen, and suspended solids. It was found in most cases that an increase in the various parameters is directly related to increases in turbidity. Table II-3, taken from the Iowa River study, shows the values obtained. Station 1 is the most upstream sampling point. Gage stations located near sampling stations 2, 7, and 18 had measured flows of 226 cfs, 173 cfs, and 2360 cfs, respectively.

The loss estimates on the Iowa River indicate the seriousness of sedimentation in the Iowa streams and lakes. The suspended solids discharge ranged from a low of 39 tons/day in the upper reaches of the river where flows were low, to 82,835 tons/day in the lower reaches with high flows. While this value represents a peak rather than an average discharge value, it illustrates the problems agricultural nonpoint pollution creates in Iowa. An average value found at the UHL quarterly monitoring station on the Iowa River was 184 tons per day.

## TABLE II-3

### Selected Chemical and Bacteriological Data
### for the Iowa River
### 29 May 1976

Values in mg/l unless designated otherwise

| Station | Fecal Coliform per 100 ml | Specific Conductance | Organic Nitrogen | Ammonia Nitrogen | Nitrate Nitrogen | Total Phosphate | D O | BOD | COD | Turbidity (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 23,000 | 650 | 1.6 | 0.22 | 17 | 0.44 | 7.5 | 3 | 28 | 68 |
| 2 | 38,000 | 530 | 3.4 | 0.38 | 13 | 0.61 | 7.4 | 5 | 28 | 172 |
| 3 | 400 | 650 | 1.1 | 0.12 | 8.7 | 0.13 | 9.3 | 2 | 8 | 28 |
| 4 | 120 | 720 | 1.1 | 0.04 | 10 | 0.15 | 10.0 | 2 | 20 | 31 |
| 5 | 190 | 690 | 1.2 | 0.02 | 10 | 0.16 | 9.1 | 3 | 8 | 27 |
| 6 | 230 | 700 | 1.4 | 0.06 | 10 | 0.18 | 9.3 | 2 | 24 | 27 |
| 7 | 550 | 720 | 1.1 | 0.08 | 11 | 0.17 | 8.8 | 2 | 16 | 25 |
| 8 | 330 | 730 | 0.93 | 0.05 | 12 | 0.20 | 8.0 | 2 | 20 | 30 |
| 9 | 100 | 710 | 0.58 | 0.02 | 12 | 0.21 | 8.8 | 2 | 18 | 30 |
| 10 | 80 | 710 | 0.56 | 0.02 | 12 | 0.17 | 8.4 | 2 | 20 | 27 |
| 11 | 70 | 710 | 0.42 | <0.01 | 12 | 0.18 | 9.4 | 2 | 10 | 25 |
| 12 | 500 | 720 | 0.42 | 0.06 | 13 | 0.19 | 9.0 | 2 | 8 | 19 |
| 13 | 300 | 690 | 0.39 | 0.01 | 12 | 0.19 | 9.4 | 2 | 8 | 20 |
| 14 | 1,100 | 670 | 0.76 | 0.02 | 12 | 0.18 | 8.4 | 2 | 10 | 44 |
| 15 | 4,000 | 670 | 0.81 | 0.02 | 15 | 0.28 | 6.8 | 2 | 12 | 80 |
| 16 | 12,000 | 640 | 3.2 | 0.06 | 15 | 0.82 | 6.6 | 2 | 83 | 232 |
| 17 | 20,000 | 410 | 57 | 0.60 | 12 | 2.8 | 7.6 | 7 | 640 | 560 |
| 18 | 11,000 | 560 | 28 | 0.21 | 8.7 | 0.97 | 9.0 | 3 | 250 | 640 |
| 19 | 16,000 | 540 | 37 | 0.35 | 10 | 1.2 | 8.1 | 6 | 300 | 1600 |
| 20 | 29,000 | 400 | 76 | 0.64 | 7.1 | 2.0 | 6.1 | 7 | 520 | 2900 |
| 21 | 30,000 | 430 | 33 | 1.2 | 7.5 | 3.2 | 5.5 | 9 | 890 | 4800 |
| 22 | 6,000 | 620 | 7.4 | 0.20 | 16 | 0.68 | 7.4 | 4 | 130 | 1200 |

A similar study conducted by UHL on Wolf Creek after heavy rains also showed the effects of land runoff[4]. Wolf Creek, located in Central Iowa, drains 328 square miles of primarily agricultural land with no major point discharges. Results showed the same correlation among high flow, high turbidity and the other parameters mentioned in the Iowa River survey.

To determine the effects of high nitrogen and phosphorus in streams and lakes, a study was conducted on the Iowa Great Lakes in northwest Iowa[5]. The major sources of nutrients in this lake system are agricultural runoff and rainfall.

This study showed a definite correlation between the algal concentration and the amount of phosphorus and inorganic nitrogen entering the lake. During the periods of high phosphorus and nitrogen imputs, the largest algal blooms were found. Those lakes with the highest phosphorus imput were also found to have the largest algae blooms.

Another study conducted by Howard Johnson on Four Mile Creek, located in Central Iowa, found concentrations in excess of the 10 mg/l nitrates standard for public water supplies[6]. The source of the nitrates was primarily from tile lines draining waterways in the low areas of the watershed. Some nitrate runoff also came from row-cropped and pastured areas, but to a lesser extent. Nitrate levels in the fall of 1977 were measured as high as 18 mg/l. Although the nitrate standards apply to only finished drinking water, elevated levels in the raw supply can increase the cost of water treatment, and pose a threat to the use of private wells.

The Iowa River survey mentioned previously, and the Buffalo Bill Watershed Study done in 1973 and 1974 provide data on pesticide levels in water[7]. The Buffalo Bill Watershed, located in eastern Iowa in Scott County, is a small watershed draining cropland and pasture land. Table II-4, taken from the Iowa River study, shows the pesticide concentrations found in the two areas. These concentrations are relatively high, but, are not known to be at a dangerous level.

As with other parameters in the Iowa River survey, high pesticides correlated well with high turbidity, which is to be expected, as pesticides often attach to soil particles. Both studies found short-lived pesticides present in the water immediately after application to croplands. Although these pesticides do not persist in the environment for long time periods, further studies should be conducted to determine the effects of these short term pesticides on the aquatic environment.

The fact that current sampling efforts are still detecting the presence of DDE and dieldrin, which have been banned for several years, illustrates the persistence of some pesticides in the environment. Although the initial runoff level of pesticides may not be critical, this tendency to persist and biologically magnify in the environment, in aquatic organisms, and in fish can result in the effects mentioned earlier, i.e., fish kills, behavioral and pathological effects on fish, etc. In October 1976, Coralville Reservoir was closed to commercial fishing due to dieldrin residue levels found in fish flesh which exceeded the Food and Drug Administration's acceptable concentration of 0.3 mg/kg. The Iowa Conservation Commission estimates the ban on commercial fishing resulted in a loss of $750,000 and 6 million pounds of fish[8]. The reservoir is still closed to commercial fishing, and the area has been posted, warning local fisherman of the danger of high pesticide levels in channel catfish. The Iowa Conservation Commission has also found that Red Rock Reservoir contains fish with high dieldrin residues, and is a "borderline" situation for closing to commercial fishing.

Table II-4

|  | Buffalo Bill Survey Maximum Pesticide Values* |  | Iowa River Survey Maximum Pesticide Values* |
|---|---|---|---|
|  | 1973 | 1974 | 1975 |
| Lasso | ND | 21,000 | 35,000 |
| Atrazine | ND | 1,100 | 30,000 |
| Treflan | ND | ND | 290 |
| Dyfonate | ND | 3,800 | 5,800 |
| DDT | 18 | 33 | ND |
| DDE | 31 | 20 | 80 |
| Aldrin | 21 | 110 | ND |
| Dieldrin | 130 | 780 | 700 |
| Chlordane | 22 | 115 | 500 |
| Heptachlor | 9 | 130 | 1,200 |
| Heptachlor Expoxide | 32 | 70 | 90 |

ND = Not Detected
* All values in parts per trillion (ppt)

A 1976 study of several rivers, lakes, shallow wells and finished drinking water supplies showed detectable pesticide contamination in all surface waters studied[9]. The amounts fluctuated with the agricultural runoff predictions, with the highest amounts evident in the spring after heavy rainfall on the upstream watersheds. Pesticide levels ranged from 0.5 to 42,000 parts per trillion (ppt).

Shallow wells located within the flood plain of a contaminated river, and finished drinking water taken from these surface waters or shallow wells, were also contaminated. Treatment processes, even charcoal filtration, were found ineffective in reducing the pesticide concentration. While these concentrations are well below any toxic levels which have been determined, accumulative effects must still be considered.

Fish kills, odor and taste problems in streams and lakes are often difficult to attribute to a specific nonpoint pollutant, because of the complexity of biological systems. Several different factors may be contributing to a particular problem. For example, a fish kill may be caused by turbidity, low dissolved oxygen, high pesticide or high nutrient levels. The fish kill may result from a combination of all the factors, or as a result of just one of them. Because all these factors may be present at the same time, identifying the cause of the problem can be difficult.

From 1969 to 1974 twenty-five fish kills in Iowa were reported to EPA for its annual fish kill report. Of these, the cause of five fish kills could not be specifically identified. Seven of the fish kills were attributed to agricultural pollution, with five of these classified as complete or heavy fish kills[10]. Agricultural operations which were noted as contributing to the fish kills were pesticides, fertilizers, and manure, silo, and feedlot drainage.

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# SECTION III

## Forward

Since the State of Iowa submitted its 1975 water quality report additions have been made to the program description. The Environmental Protection Agency approved the State of Iowa's NPDES program and a proposal on pretreatment has also been submitted to the Environmental Protection Agency. The following is a description of these programs.

# Section III.

## Program Update

### National Pollutant Discharge Elimination System (NPDES) Program

Prior to August 1978, an Iowa Operation Permit from DEQ and a National Pollutant Discharge Elimination System (NPDES) permit from the Environmental Protection Agency (EPA) were required for a municipality or industry to discharge into the waters of the state. This resulted in much duplication of paperwork and effort for DEQ, EPA, and the municipalities and industries involved. To alleviate this duplication, Iowa obtained the authority on August 10, 1978 to issue NPDES permits pursuant to section 402 of the Clean Water Act.

The requirements of the NPDES permit parallel those of the Iowa operation permit, making transition to the NPDES program relatively easy. Chapter 19, Wastewater Construction and Operational Permits, of the Iowa Water Quality Commission rules, contains the requirements for issuance of an NPDES permit. The major change from the Iowa operation permit system is the requirement for public notification. Prior to issuance of an NPDES permit, public notice must be given and a thirty (30) day comment period provided. If, during this period, written requests or petitions for a public hearing are filed, the Executive Director of DEQ will hold such a hearing. Proper notification of public hearings is covered in Chapter 19.

The Iowa NPDES permit program does not cover those waste disposal systems that do not have a direct discharge to navigable waters. Disposal systems of this type will be issued operation permits pursuant to Chapter 19, Section 19.3 of the Iowa Water Quality Commission rules.

The State NPDES permit program will be the principal enforcement mechanism for attaining and maintaining compliance with the Iowa Water Quality Standards. It is anticipated that State limitations will require at least the degree of limitation required for the NPDES. The Iowa Department of Environmental Quality is currently applying and will continue to apply effluent limitations in accordance with the following, when applicable:

1. Effluent limitations based on best practical treatment and secondary treatment as defined by the Administrator pursuant to the Section 301 and 302 of the Act;
2. Standards of performance, as published by the Administrator, for new sources under Section 306 of the Act;
3. Effluent standards, effluent prohibitions, and pretreatment standards under section 307 of the Act;
4. More stringent limitations deemed necessary to meet the requirements of the State's continuing planning process, requirements necessary to comply with any plan approved pursuant to Section 208 (b) of the Act, or requirements necessary to comply with Iowa Water Quality Standards pursuant to Section 510 of the Act.
5. If the permit is for the discharge of pollutants into the navigable waters from a vessel or other floating craft, any applicable regulations promulgated by Secretary of the Department in which the Coast Guard is operating, establishing specifications for safe transportation, handling, carriage, storage, and stowage of pollutants.
6. Such conditions as the Executive Director determines are necessary to carry out the provisions of the Act, prior to promulgation by the Administrator of applicable effluent standards and limitations pursuant to sections 301, 302, 306, and 307.

The Executive Director will state that the discharge authorized by any Iowa NPDES permit will not violate applicable water quality standards and other applicable effluent limitations or requirements. In cases where the effluent limitations in the NPDES permit are based on water quality standards, a waste-load allocation will be prepared to ensure that the discharge authorized is consistent with aplicable water quality standards.

Every NPDES permit issued by the Iowa Department of Environmental Quality for a discharging facility will specify, where appropriate, average and maximum daily quantitative limitations for pollutants appropriately expressed by weight, in the authorized discharge. Limitations not properly expressed by weight shall be expressed in other more appropriate units. In addition, the Executive Director may require other limitations, such as average or maximum concentration limits.

As the Iowa NPDES permit program is now being administered by the Iowa Department of Environmental Quality, any municipal applicant whose discharge is not in compliance with applicable effluent standard limitations, applicable water quality standards, or other legally applicable requirements described in Section 124.42, and has received a 301(i) extension for compliance with the 1977 final effluent limitations, is issued a schedule of compliance as part of his NPDES permit. The permittee is required to take specific steps to (1) return the treatment works to original design specifications, when it is anticipated that such facilities will produce a discharge capable of meeting all applicable limitations, or to (2) initiate planning and construction of an expanded or completely new treatment works. Treatment works must be in compliance by July 1, 1983.

The permittee is required to submit progress reports to the Iowa Department of Environmental Quality as part of the compliance schedule. Pursuant to Chapter 19 of the rules of the Iowa Water Quality Commission, concerning the construction or modification of treatment facilities, submittal of a preliminary engineering report and final plans and specifications may be included in the compliance schedule. The permittee shall achieve compliance with effluent limitations in the shortest, reasonable period of time. Such period is to be as consistent as possible with the guidelines, requirements, goals and objectives of the Act.

The Executive Director will require written notice of the permittee's compliance or noncompliance with the interim or final requirements either before or up to fourteen (14) days following each interim date and the final date of compliance.

If a permittee fails or refuses to comply with an interim or final requirement in a State NPDES permit, such noncompliance shall constitute a violation of the permit. The Executive Director may then modify, suspend or revoke the permit or take direct enforcement action.

Those facilities which have not received approval of a 301(i) extension and are not in compliance will be dealt with on a case by case basis. Factors which will be considered for determining further action are:

1. Availability of grant funds.
2. Ranking on the fundable project priority list.
3. Significant contribution to delay by the treatment facility.
4. Construction grant or permits review causing schedule delay.

Action which may be taken to insure compliance include:

1. Issuing a permit with a compliance schedule requiring completion of construction by no later than July 1, 1983.
2. Issuing a permit requiring immediate compliance.
3. Issuing an Executive Order requiring compliance.
4. Referral to the Attorney General's office for legal action.

## Pretreatment Program

This section provides a brief narrative of the State's current ability and future direction in developing the State's pretreatment program. The intent of the pretreatment program is to:

1. Prevent the introduction of pollutants into publicly owned treatment works (POTWs) which will interfere with the operation of the POTW or contaminate the sewage sludge;
2. Prevent the introduction of pollutants into POTWs which will pass through the treatment works untreated; and
3. Improve opportunities to recycle and reclaim wastewaters and the sludges resulting from wastewater treatment.

The rules and regulations for administering the program are covered under 40 CFR 403.10(b).

### 1. Identification of POTW's Required to Develop Pretreatment Programs.

The State will use the following procedure to determine those POTW's which will be required to establish a pretreatment program.

a. Those POTW's which are permitted by their NPDES permit to discharge greater than 5 mgd hve been noted. Those POTW's in any phase of the construction grant process with an average design flow greater than 5 mgd have been noted. 18 POTW's are subject to the greater than 5 mgd criterion. They are listed in Appendix A with their design flows.

b. The state will assemble a complete list of major contributing industries, including any industry in Appendix C of 40 CFR part 403, for each POTW. This list will include those POTW's under 5 mgd.

The state will use as sources of information the "Directory of Iowa Manufacturers" published by the Iowa Development Commission; a computer printout of major contributing industries as listed in the Iowa operation permits; information supplied in the 201 facilities plan; and treatment agreement forms from industrial contributors.

The latter is a legal document entered into by the POTW and each significant industrial contributor. See rule 400--19.6(5) of the Iowa Administrative Code (I.A.C.). It lists the discharge frequency and flow, and limits the chemical constituents which the industrial user has agreed to discharge. Appendix B is an example of this form. It is estimated that less than 6 POTW's under 5 mgd will have one or more of the industries listed in Appendix C of 40 CFR Part 403.

c. From the list obtianed in (b) above, the state will evaluate the POTW's with less than 5 mgd to determine whether they should be required to develop a pretreatment program by using one or more of the following criteria.

1) If the permit conditions for either conventional or toxic pollutants are being violated frequently. Frequent violations may indicate an operational problem caused by some wastewater constituent toxic.

2) If the pollutant passes through the POTW untreated.

3) If the sludge process train shows interference by some wastewater constituent or if a certain sludge characteristic will not meet applicable disposal requirements. (The sludge disposal requirements are stated in rule 400--28.6(455B) I.A.C. and chapter 400--33 I.A.C.)

d. If a pretreatment program is found to be required of POTW, the NPDES permit will have a notification clause inserted along with a compliance schedule and the specific appeal procedures.

To date an inventory of those POTW's over 5 mgd has been completed by staff as outlined in sub section (a) above. Some additional inventory efforts have been initiated on the major contributing industries to POTW's under 5 mgd. About 3 staff weeks of effort will be required to complete the evaluation. This will be done by staff currently associated with the industrial NPDES functions of the Department. It is anticipated that these same staff members will also answer questions on specific POTW pretreatment programs. Additionally, a documentation file is being assembled which will include applicable state rules, and sample ordinances and pretreatment programs developed by EPA and other POTW's. This documentation would be made available upon request. All legal inquiries would be returned to the attorneys in the Department's Compliance and Planning Division.

## 2. POTW Notification of Pretreatment Requirements.

While determining those POTW's required or suspected of being required to develop a pretreatment program, the Department will assemble applicable rules, sample ordinances and existing pretreatment programs. This documentation file will be made available to the POTW's and their consultants. Since it is anticipated that fewer than 25 POTW's may be required to develop a pretreatment program the use of the Department's complete construction grant section's computer mailing system is not applicable. A seperate mailing list will be assembled by NPDES staff for use only in mass mailings of necessary documentation. Not all POTW's will be requiring the same type of documentation, as several already have some type of program developed.

3. Incorporation of Pretreatment Requirements into NPDES Permits.

For those POTW's identified as requiring development of a pretreatment program and those suspected of requiring the program, the Department will include in their NPDES permit, under the compliance schedule, the requirement for developing a pretreatment program including appropriate compliance dates. This requirement will be applicable to only those permits issued after approval of the state's pretreatment program (by September 25, 1980).

For those POTW's identified as requiring or suspected of being required to develop a pretreatment program, who's NPDES is issued prior to approval of the state's pretreatment program (before September 25, 1980) the permit will have a modification clause attached. This clause will inform the permittee that a pretreatment program may be required and that they should be contacting the Department for additional information and assistance.

For the POTW's listed in Appendix A the Department does not anticipate revoking and reissuing or modifying any NPDES permits for the purpose of meeting the provisions of sections 301(i) or 301(h). Extension requests under these sections will be evaluated as the permits expire. Any NPDES permits that do not require a 301(i) extension will be modified as they expire and will include the modification clause if the permit expires prior to the approval of the State's pretreatment program. If they expire after the approval of the state's pretreatment program, the permit will include a compliance schedule for the development of a pretreatment program.

As noted, Appendix A is a list of those POTW's expected to be required to develop a pretreatment program. Included are the expiration dates of their NPDES permit and the type of notification regarding the requirements of a local pretreatment program which the permit will reflect.

4. Procedure to Make Determinations on Requests for POTW Pretreatment Program Approval and Removal Allowances.

The procedure by which the Department will take actions on pretreatment program approval and on any removal allowances request will be a four step process.

a. Upon receipt of any request, notification will be sent to adjoining states whose waters may be affected, to affected 208 agencies, and to interested groups or individuals. The list of agencies and interested parties will be extracted from the State's NPDES permit notification list. Included on this list will be the address of the largest newspaper which will receive notice for publication regarding the pretreatment program or removal allowance requests. All notices will include the comment period, source of information and to whom comments are to be sent.

b. If requested and warranted, a public hearing will be provided. Notification will be sent to the same parties in (a) above including the local papers for published notices.

c. Staff shall review the requests for compliance with the required documentation set forth in EPA and State rules and guidelines. Comments from interested parties and EPA will be considered in the Department's determination on the requests. Considerable communications with both the POTW and EPA are expected on several of the larger and more complex pretreatment programs and on several of the removal allowance requests.

d. Public notification of the final determinations will be sent to the interested agencies and parties in (a) and (b) above and to the local newspaper for publication. Additionally an article on the final determination will be included in the weekly Departmental publication "ETC" which has a multistate circulation.

In the review of pretreatment programs for the POTW's shown in Appendix A, the projected staff requirement is shown in detail in Appendix C. In summary, staffing projections are: FY 79 - 1.6 staff year, FY 80-83 slightly more than 1 staff year per year. This includes staff time for public notifications and hearings review of requests, and interagency communications. Funding sources which the Department will pursue have not been finalized. However, it is expected that Section 106 and 208 grant funds may be requested to assist in the staffing costs for this pretreatment program. Since the program will be carried as a part of existing staff functions (i.e., NPDES permit and 201 industrial facilities plan review) this program will be intergrated easily into existing cost centers.

## 5. Identification and Notification of Industrial Users Subject to Pretreatment Requirements.

The procedure outlined in section 1 above is expected to determine all major contributing industries. All major contributing industries included in the 21 industrial categories of Appendix C of 40 CFR part 403 will be separately listed. The notification procedure for major contributing industries to POTW's required to have a pretreatment program will be:

a. First, contact the POTW for its aid in contacting the industrial user. The intent is to keep the program as much as possible at the local level.

b. If this does not accomplish notification of an industry, then the Department will notify it directly, with notices also to the POTW. The notice will include specific information on pretreatment requirements, funding sources and potential removal allowances by the POTW.

The Department anticipates POTW's will voluntarily meet the requirements for a pretreatment program. Thus staffing requirements for this activity are nill. Most POTW in the state are already aware of the future requirements, with some already having some type of pretreatment requirements implemented.

## 6. Procedure for Identification of Character and Volume of Pollutants Contributed by Industrial Users to POTW's.

The department does not anticipate developing and implementing a pretreatment program in lieu of the local program. To date most POTW's have shown a positive attitude toward local implementation. However, if the situation were to occur where the Department had to develop a local pretreatment program, the development of a program would not be a major modification since several similar activities are already performed by Department staff. The initial steps in the inventory and assessment of developing a program have already been performed by the Department staff. Thus, the Department does not anticipate amy major field work in the inventory of industrial users to those POTW's not required to develop the pretreatment program. Who they are, what and how much they contribute and their effect on the POTW is information currently available to the Department from on-going programs.

7. Procedures in Making Determinations on Requests for Fundamentally Different Factor Variances.

The pretreatment program will be developed to receive and review all requests from industrial users for fundamentally different variances. In accordance with this program any industrial user or interested party may apply when their industrial plant has a special situation not considered by EPA in developing it's effluent regulations. The variances will be handled on a case-by-case basis with adjustments in limitations being either more or less stringent.

The Department acknowledges the need for additional staff expertise in the review of requests for variances, if the number of requests is substantial. However, it is anticipated that these requests will not be numerous and the staffing requirements should be minimal. Appendix C reflects the staff time based on the estimated rule promulgation time frame and the number of affected industrial users in the State. The funding sources for staff support may come from 106 or 208 funds as noted above.

The procedure for addressing the various requests should follow the following five step process:

a. Staff will screen the request immediately upon receipt to insure completeness. The requestor will be notified of any deficiency.
b. The Department will review and evaluate the requests based on the factors and criteria outlined in 403.13(c) and (d). Concurrent review will be requested of the Regional Administrator.
c. The Department's preliminary findings will be sent to the Regional Administrator for her concurrence and to the requestor.
d. The final determination on the request will be based on both agencies' findings, with a notice being sent to the requestor.
e. Public hearing or adjudicatory hearing will be available only through EPA's Enforcement Division Director's office.

### 8. Procedure to Ensure Compliance with Pretreatment Standards and Permit Conditions.

As noted in Section 6, the Department does not anticipate assuming the development and implementation of local pretreatment programs. However, if the Department were to assume the implementation role, then several current activities could be modified to perform the necessary functions. In the Department's surveillance section of the Chemical and Water Quality Division, several tasks have been: to review industrial monitoring reports for compliance with effluent limitations; to perform periodic sampling of discharges; and to have approved laboratory analysis performed on the influent and effluent samples. Several certified laboratories within the State could be contracted with to perform the required analysis. Most spot-checks sampling would be by Department staff with industrial users responsible for normal sampling and analysis.

As indicated above, the Department does not anticipate this effort as a staff function; however the actual staff time required to do the few possible cases would be less than 10% of other pretreatment staffing requirements.

## Appendix A

## POTW's Projected to Require a Pretreatment Program

| | Municipality | Design Flow (mgd) | Iowa Op. Permit Exp. Date | NPDES Exp. Date | Type of Notification In Permit |
|---|---|---|---|---|---|
| 1. | Ames | 6.0 | 3/30/80 | 6/30/77 | Modification Clause |
| 2. | Burlington | 8.5 | 6/30/80 | 6/30/77 | Modification Clause |
| 3. | Cedar Rapids | 28.6 | 6/31/79 | 6/31/79 | Modification Clause |
| 4. | Clinton | 7.5 | 9/30/82 | 3/1/77 | Compliance Schedule |
| 5. | Council Bluffs | 12.85 | 10/31/82 | 10/31/82 | Compliance Schedule |
| 6. | Davenport | 26.0 | 1/31/82 | 1/31/82 | Compliance Schedule |
| 7. | Des moines | 43.1 | 7/31/82 | 4/24/77 | Compliance Schedule |
| 8. | Dubuque | 15 | 2/01/82 | 2/01/82 | Compliance Schedule |
| 9. | Ft. Dodge | Unknown | 9/30/81 | 5/25/82 | Compliance Schedule |
| 10. | Ft. Madison | 6.2 | 9/30/81 | 9/30/81 | Compliance Schedule |
| 11. | Iowa City | 8.0 | 7/01/79 | 7/01/79 | Modification Clause |
| 12. | Keokuk | 5.0 | 7/31/80 | 7/31/80 | Modification Clause |
| 13. | Marshalltown | 8 | 12/01/78 | 12/01/78 | Modification Clause |
| 14. | Mason City | 6.5 | 2/02/81 | 2/02/81 | Compliance Schedule |
| 15. | Muscatine | 13 | 5/31/81 | 5/31/81 | Compliance Schedule |
| 16. | Ottumwa | 7.1 | 6/22/80 | 10/07/80 | Modification Clause |
| 17. | Sioux City | 21 | 4/30/79 | 6/30/77 | Modification Clause |
| 18. | Waterloo | 20.4 | 3/01/80 | 6/30/77 | Modification Clause |
| POTW's less than 5 mgd | | | | | |
| 1. | Comanche | .600 | 5/31/79 | 5/31/79 | Modification Clause |
| 2. | Cedar Falls | 4.67 | 9/01/79 | 9/01/79 | Modification Clause |
| 3. | Denison | 1.05 | 7/01/79 | | Modification Clause |
| 4. | Manchester | 1.00 | 2/29/78 | 6/30/77 | Modification Clause |
| 5. | Newton | 4.48 | 12/01/78 | 6/30/77 | Modification Clause |
| 6. | Spencer | 3.7 | 10/31/82 | 10/12/75 | Compliance Schedule |

APPENDIX B

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY
CHEMICAL AND WATER QUALITY DIVISION
TREATMENT AGREEMENT MAJOR CONTRIBUTING INDUSTRY

FOR DEQ USE ONLY
Fac. No. ____________________
Ind. Cont. Agreement No. __________
Replaces Agreement No. __________

Statement of the "Major Contributing Industry" requesting authorization to use "Publicly Owned Disposal System" or "Privately Owned Disposal System"

I, the undersigned, being the duly authorized representative for ____________________

____________________________________________________________
(name,mailing address of major contributing industry)

do hereby state that the proposed discharge to the ____________________ (identify owner and ____________________ facility name and number) shall not exceed the quantities listed in Attachment A after ____________________ (include date).

____________________________________
Signature of Authorized Representative

____________________________________
Title Date

Statement of Agreement to accept and treat industrial contribution

I, the undersigned, being the duly authorized representative do hereby state that the ____________________ (identify owner of system receiving waste) does hereby accept the discharge as described in Attachment A from ____________________ (Name of ____________________ contributor) and does hereby accept responsibility for providing treatment of the volume and quantity of waste as described in Attachment A, in accordance with the provisions of Chapter 455B, Code of Iowa 1977 and the Rules of the Department of Environmental Quality. This agreement is conditioned on the industrial contributor complying with all applicable Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) standards and requirements. This agreement is entered for the purpose of identifying pollutants contributed and limiting the quantity contributed; and, this agreement shall not otherwise be construed to affect local ordinances, sewer service agreements or fee systems entered into between parties.

This agreement may be modified or terminated by the owner of the disposal system if additional pollutants or additional volumes or quantities of pollutants are contributed other than identified in Attachment A, or because of any condition that requires either a temporary or permanent reduction or elimination of the accepted contribution. Notice of any anticipated increase in pollutants contributed shall be given to the owner sufficiently in advance of such increase to allow the industrial contributor to submit a new treatment agreement to DEQ sixty days in advance of the increase or change.

Attest:

____________________________________
Signature of Authorized Representative

____________________________________
Title Date

____________________________________
Signature of Clerk or Secretary

____________________________________
Title Date

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Instructions On Other Side ➡

## INSTRUCTIONS FOR COMPLETING THE REVERSE SIDE

Major contributing industries are required to execute this form and have it on file with the Iowa Department of Environmental Quality (DEQ) by March 1, 1978. A new treatment agreement form should be submitted sixty days in advance of a proposed expansion, production increase or process modification that may result in discharges of sewage, industrial waste or other waste in excess of the contribution stated in the existing treatment agreement. A treatment agreement form must be submitted by the contributor one hundred eighty days before a new major contributing industry proposes to discharge into a wastewater disposal system.

A treatment agreement form for each major contributing industry must be submitted with the facility plan or preliminary engineering report for construction or modification of a wastewater disposal system. These will be used in determining the design of the new system. Treatment agreement forms are also required in an application for a permit to operate a wastewater disposal system.

The following definitions shall apply:

1. "Authorized Representative" means an official who has been designated by the major contributing industry or owner to act on their behalf.
2. "Owner" means the legal owner of the sewerage system which will receive the wastes contributed by the proposed project.
3. "Major Contributing Industry" means an industrial user of a treatment works that:
    a. Has a flow of 50,000 gallons or more per average work day;
    b. Has a flow greater than five percent of the flow carried by the treatment works receiving the waste;
    c. Has in its waste a toxic pollutant in toxic amounts as defined in standards issued under section 307(a) of the Act and adopted by reference in 17.5(455B); or
    d. Is found by the Department to have a significant impact, either singly or in combination with other contributing industries, on that treatment works or upon the quality of effluent from that treatment works.

ATTACHMENT A

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY

TREATMENT AGREEMENT MAJOR CONTRIBUTING INDUSTRY

1. Name of Industrial Contributor ______________________________

2. Address ______________________________

3. Name of Auth. Rep. ____________________ Phone ____________

4. Primary Standard Industrial Classification Code (SIC) ____________

5. Product(s)/Raw Material(s) Maximum Quantity Per Day

| Product(s)/Raw Material(s) | Maximum Quantity Per Day |
|---|---|
| | |
| | |

6. Describe Pretreatment Provided

7.

| Compatible Waste in Contribution | Peak Daily Average Over a 30 Day Period | Maximum for any 24 Hr. Period | Average During the Hrs. of Operation on the Peak Day of Operation |
|---|---|---|---|
| Flow, million gal. per day | | | |
| $BOD_5$, lbs. | | | |
| Total Suspended Solids, lbs. | | | |
| Total Kjeldahl Nitrogen, lbs. | | | |
| Oil & grease, mg/l | | | |
| Other | | | |

8. Range of pH Level in Contribution __________ Peak Hourly Flow Contribution ________

9. Hours of operation during the Peak Day of Operation ____ Days of Operation/Wk ______

10.

| Incompatible Wastes in Contribution | Peak Daily Average Over a 30 Day Period lbs/day | Maximum for any 24 Hr. Period lbs/day | Maximum During Any Hour | |
|---|---|---|---|---|
| | | | mg/l | lbs/hr. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

11. Describe any batch or periodic discharges

12. ______________________________ ____________

Signature of Authorized Representative Date

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Instructions on Other Side ➡

## INSTRUCTIONS FOR COMPLETING ATTACHMENT A

1. Give the name of the industrial contributor.

2. Give the address that designates the location of the industrial contributor.

3. Name the Industrial Representative who is authorized to execute the Treatment Agreement and include his/her telephone number.

4. Enter the Industry's Standard Industrial Classification Code Number (SIC Code). The 1972 edition of the "Standard Industrial Classification Manual" includes SIC code numbers and their descriptions. Manuals can be obtained from the Superintendent of Printing, U. S. Government Printing Office, Washington, D. C., 20402.

5. Specify the principal product(s) or the principal raw material(s) and the maximum quantity produced or consumed in any day. Quantities are to be reported in the units of measurement found in "Table III (Units of Measurement by SIC Code)". This table is available from the Department upon request. Other industrial SIC catagories not included in Table III should be included in units of measurement normally used by that industry.

6. Describe all pretreatment of waste prior to discharge from the contributor.

7. *COMPATIBLE WASTE IN CONTRIBUTION means any waste parameter discharged for which the receiving treatment works was designed to treat and does remove to a significant degree. The PEAK DAILY AVERAGE OVER A 30 DAY PERIOD is to represent the maximum 30 day average likely to occur in any year. Days when no discharge occurs should not be included in the average. The MAXIMUM FOR ANY 24 HOUR PERIOD is the maximum contribution during the peak day. The AVERAGE DURING THE HOURS OF OPERATION ON THE PEAK DAY OF OPERATION is to be expressed as the rate during that period. A rate of 1.0 mgd during a 12 hour period means that 0.5 million gallons was discharged in 12 hours. Operation time includes time allocated to cleanup if a wastewater discharge occurs.

8. Include the range of pH level and peak hourly flow of the contribution to the receiving treatment works.

9. Include hours of operation during the peak day of operation and the number of days per week the facility is in operation.

10. *Incompatible Waste means any waste which is not a compatible waste (see #7 above). List all such waste parameters that are contributed in concentrations greater than present in the raw water supply. PEAK DAILY AVERAGE OVER A 30 DAY PERIOD (See #7 above). MAXIMUM FOR ANY 24 HOUR PERIOD (See #7 above). The MAXIMUM DURING ANY HOUR is to represent the maximum discharge during any single hour of operation. Continue listing parameters on a separate page if necessary.

11. Describe any occasional or intermittant discharges. Examples could be blood wastes, milk wastes, detergents, etc. Include the frequency of discharges and the amount. Such discharges could upset a treatment plant because of the shock effect of a sudden change in influent loading.

12. The representative responsible for executing the treatment agreement should sign and date this form.

*The values given represent maximum values that will not be exceeded during the time frame indicated.

## Appendix C

### Projected Staffing Requirements for the State's Pretreatment Program

| Activities | Fiscal Year Staff Weeks | | | | |
|---|---|---|---|---|---|
| | 79 | 80 | 81 | 82 | 83 |
| 1. Complete inventory of POTW's over 5 mgd. | 1 | - | - | - | - |
| 2. Complete inventory of significant industrial contributors and those within the EPA 21 industrial catagories | 3 | - | - | - | - |
| 3. Assemble, file and review applicable pretreatment information | 10 | - | - | - | - |
| 4. Prepare Notification document for those POTW's requiring a pretreatment program. Includes significant meeting time. | 10 | 3 | 5 | 3 | - |
| 5. Recieve and process POTW pretreatment program information requests. | 5 | 5 | 7 | 5 | - |
| 6. Recieve and process POTW pretreatment programs and removal allowance requests. Includes public notification. | .5 | 2 | 4 | 2 | 2 |
| 7. Review pretreatment programs and removal allowance requests. | 10 | 10 | 20 | 10 | 10 |
| 8. Receive and process requests for variances in pretreatment requirements. | 5 | 7 | 5 | 5 | - |
| 9. Review requests for variances in pretreatment requirements | 10 | 14 | 10 | 10 | 10 |
| 10. Confer with EPA on preliminary findings on all requests and process final recommendations. | 5 | 5 | 5 | 5 | 5 |
| 11. Participate in public hearings or legal actions as required. | 10 | 20 | 10 | 10 | 10 |
| Projected Total | 74.0 | 66.0 | 66.0 | 50.0 | 37.0 |

# APPENDICES

Iowa's water quality standards are listed in Appendix A-1. Appendix A-2 is a listing of all water quality standards violations. The stream segment, classification, parameter, number of samples and violations, and the source of the problem are provided.

Appendix A-3 is the discharge inventory for all municipal, industrial and semi-public discharges. The current discharge, final permit limitation, and compliance date are provided.

# APPENDIX A-1

# IOWA'S WATER QUALITY STANDARDS

# STATE WATER QUALITY STANDARDS

| Stream Classification | Water Use | Parameter | Dates in Effect* | Standard |
|---|---|---|---|---|
| A | Swimming and water skiing | Fecal Coliform | April through Oct. 31 | 200 org/100 ml |
|  |  | pH | - - - | Not less than 6.5 and not more than 9.0 |
| B(W) | Aquatic life and secondary recreation. | Dissolved Oxygen | - - - | Not less than 5.0 mg/1 during at least 16 hours in a 24-hour period and not less than 4.0 mg/1 anytime during a 24-hour period. |
|  |  | Arsenic | - - - | 0.1 mg/1 |
|  |  | Barium | - - - | 1.0 mg/1 |
|  |  | Cadmium | - - - | 0.01 mg/1 |
|  |  | Chromium (total (hexavalent) | - - - | 0.05 mg/1 |
|  |  | Copper | - - - | 0.02 mg/1 |
|  |  | Cyanide | - - - | 0.005 mg/1 |
|  |  | Lead | - - - | 0.1 mg/1 |
|  |  | Mercury | - - - | 0.05 mg/1 |
|  |  | Phenol* | - - - | 0.05 mg/1 |
|  |  | Selenium | - - - | 0.1 mg/1 |
|  |  | Zinc | - - - | 1.0 mg/1 |
|  |  | Ammonia Nitrogen (N) | Nov. 1 to Mar. 31 | 5.0 mg/1 |
|  |  |  | Apr. 1 to Oct. 31 | 2.0 mg/1 |
|  |  | Fecal Coliform | Apr. 1 to Oct. 31 | 2,000 org/100 ml. |
|  |  | pH | - - - | Not less than 6.5 and not more than 9.0. |
|  |  | Temperature | - - - | Not greater than $32^{o}C$ |

*Includes all phenolic compounds

STATE WATER QUALITY STANDARDS (Cont.)

| Stream Classification | Water Use | Parameter | Dates in Effect* | Standard |
|---|---|---|---|---|
| B(C) | Cold water aquatic life and secondary recreation. | Dissolved Oxygen | - - - | Not less than 7.0 mg/1 during at least 16 hours of any 24-hour period and not less than 5.0 mg/1 at any time during the 24-hour period. |
| | | Arsenic | - - - | 0.1 mg/1 |
| | | Barium | - - - | 1.0 mg/1 |
| | | Cadmium | - - - | 0.0012 mg/1 |
| | | Chromium (total (hexavalent) | - - - | 0.05 mg/1 |
| | | Copper | - - - | 0.02 mg/1 |
| | | Cyanide | - - - | 0.005 mg/1 |
| | | Lead | - - - | 0.1 mg/1 |
| | | Mercury | - - - | 0.05 mg/1 |
| | | Phenol* | - - - | 0.05 mg/1 |
| | | Selenium | - - - | 0.1 mg/1 |
| | | Zinc | - - - | 1.0 mg/1 |
| | | Ammonia Nitrogen (N) | Nov. 1 to Mar. 31 | 2.5 mg/1 |
| | | | Apr. 1 to Oct. 31 | 1.0 mg/1 |
| | | Fecal Coliform | Apr. 1 to Oct. 31 | 2,000 org/100 ml |
| | | pH | - - - | Not less than 6.5 nor greater than 9.0 |
| | | Temperature | - - - | Not greater than $20^\circ$ C |
| C | Drinking water (at point of withdrawal | Combined radium-226 and radium-228 | - - - | Not to exceed 5 picocuries/1 |
| | | Gross alpha particle activity (including radium-226 but excluding radon and uranium) | - - - | Not to exceed 15 picocuries/1. |

*Includes all phenolic compounds

## STATE WATER QUALITY STANDARDS (Cont.)

| Stream Classification | Water Use | Parameter | Dates in Effect* | Standard |
|---|---|---|---|---|
| C<br>(Continued) | | Beta particle and photon radioactivity from man made radionuclides other than tritium and strontium-90. | - - - | Not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/yr. |
| | | Average annual concentration of tritium | - - - | Shall not exceed 20,000 picocuries/1. |
| | | Average annual concentration of strontium-90. | - - - | Shall not exceed 8 picocuries/1 |
| | | Arsenic | - - - | 0.05 mg/1 |
| | | Barium | - - - | 1.0 mg/1 |
| | | Cadmium | - - - | 0.01 mg/1 |
| | | Chloride | - - - | 250 mg/1 |
| | | Chromium (total hexavalent) | - - - | 0.05 mg/1 |
| | | Copper | - - - | 1.0 mg/1 |
| | | Cyanide | - - - | 0.02 mg/1 |
| | | Fluoride | - - - | 2.0 mg/1 |
| | | Lead | - - - | 0.05 mg/1 |
| | | Mercury | - - - | 0.002 mg/1 |
| | | Nitrate (as $NO_3$) | - - - | 45 mg/1 |
| | | Phenol* | - - - | 0.05 mg/1 |
| | | Selenium | - - - | 0.01 mg/1 |
| | | Silver | - - - | 0.05 mg/1 |
| | | Zinc | - - - | 1.0 mg/1 |
| | | pH | - - - | Shall not be less than 6.5 nor greater than 9.0. |

*Includes all phenolic compounds

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*Unless otherwise designated the dates in effect are year around.

# APPENDIX A-2

# WATER QUALITY
STANDARDS VIOLATIONS

WATER QUALITY RELATIVE TO STANDARDS

BASIN - Mississippi

FLOW - Moderately Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Mississippi | Near Dubuque | AB | Fecal Coliform | July 31, 1974 | 15 | 10 | 67% | Municipal & industrial discharges in Dubuque |
| Mississippi | Near Dubuque | AB | Fecal Coliform | August 22, 1974 | 17 | 15 | 88% | Municipal & industrial discharges in Dubuque |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Mississippi

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Mississippi | Lansing to Dubuque | AB | Fecal Coliform | August 2, 1976 | 3 | 1 | 33% | Non-point |
| Village Creek | Entire Length | B(c) | Fecal Coliform | August 2, 1976 | 3 | 1 | 33% | Non-point |
| Village Creek | Entire Length | B(c) | Tempera-ture | August 2, 1976 | 3 | 1 | 33% | Natural causes |
| Paint Creek | Entire Length | B(c) | Ammonia-N | August 2, 1976 | 3 | 1 | 33% | Municipal discharge at Waukon |
| Yellow River | Entire Length | B(w) | Fecal Coliform | August 2, 1976 | 5 | 1 | 20% | Non-point |
| Sny Magill | Entire Length | B(c) | Tempera-ture | August 2, 1976 | 3 | 3 | 100% | Natural causes |
| Little Maquoketa | Entire Length | B(c) | Tempera-ture | August 2, 1976 | 6 | 5 | 83% | Natural causes |

WATER QUALITY RELATIVE TO STANDARDS

BASIN - Northeastern

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Upper Iowa River | Lime Springs to New Albin | AB | Fecal Coliform | July 23, 1974 | 6 | 4 | 67% | Municipal discharges at Kendalville, Decorah, Dorchester, & New Albin |
| Upper Iowa River | Lime Springs to New Albin | AB | Fecal Coliform | March 5, 1975 | 6 | 2* | 33%* | Municipal discharge at Decorah and non-point |

WATER QUALITY RELATIVE TO STANDARDS

BASIN - Northeastern

FLOW - Moderately Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Turkey River | Entire Length | B(w) | Fecal Coliform | October 29, 1975 | 10 | 1 | 10% | Municipal discharge at Elkader |
| Turkey River | Entire Length | B(w) | Fecal Coliform | June 29, 1976 | 10 | 1 | 10% | Non-point |
| Turkey River & Tributaries | Entire Length | B(w) | Copper | June 29, 1976 | 18 | 1 | 6% | Unknown |
| Roberts Creek | Near Mouth | B(w) | Fecal Coliform | June 29, 1976 | 1 | 1 | 100% | Municipal discharge upstream of mouth |
| Peck Creek | Near Mouth | B(c) | Fecal Coliform | June 29, 1976 | 1 | 1 | 100% | Non-point |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Northeastern

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Maquoketa | Entire Length | B(W) | Fecal Coliform | October 7, 1975 | 15 | 1 | 7% | Municipal discharge at Maquoketa |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Northeastern

FLOW - High

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Wapsipinicon | Entire Length | B(w) | Fecal Coliform | June 5, 1974 | 12 | 3 | 25% | Non-point |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Winter Moderate

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Iowa | Headwaters to Tama | B(w) | Fecal Coliform | January 26, 1976 | 22 | 4* | 18%* | Municipal discharges at Eldora, Marshalltown, and Tama |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Iowa | Entire Length | B(w) | pH | Sept. 23, 1976 | 21 | 9 | 43% | Natural causes |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Winter Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Iowa | Tama to confluence with Cedar | B(w) | Fecal Coliform | January 18, 1977 | 13 | 8* | 62%* | Municipal discharges at Marshalltown & Iowa City |
| Iowa | Tama to Confluence with Cedar | B(w) | Ammonia-N | January 18, 1977 | 13 | 2 | 15% | Municipal discharge at Marshalltown |
| Iowa | Tama to confluence with Cedar | B(w) | Dissolved Oxygen | January 18, 1977 | 13 | 6 | 46% | Discharges above the survey area & municipal discharge at Marshalltown |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Cedar | Vinton to Cedar Rapids | AB(w) | Fecal Coliform | Sept. 13, 1976 | 3 | 2 | 67% | Municipal discharges above Cedar Rapids |
| Cedar | Vinton to Cedar Rapids | AB(w) | Fecal Coliform | January 11, 1977 | 3 | 3* | 100%* | Municipal discharges above Cedar River |
| Cedar | Cedar Rapids to mouth | B(w) | Fecal Coliform | Sept. 13, 1976 | 10 | 5 | 50% | Industrial & municipal discharges in Cedar Rapids |
| Cedar | Cedar Rapids to mouth | B(w) | Fecal Coliform | January 11, 1977 | 10 | 4* | 40%* | Industrial & municipal discharges in Cedar Rapids |
| Cedar | Vinton to mouth | B(w) | Dissolved Oxygen | Sept. 13, 1976 | 13 | 1 | 8% | Municipal discharge in Cedar Rapids |

WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar (Continued)

FLOW - Low (Continued)

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Cedar | Vinton to mouth | B(w) | Dissolved Oxygen | January 11, 1977 | 13 | 6 | 46% | Municipal discharge in Cedar Rapids and ice cover |
| Cedar | Vinton to mouth | B(w) | Ammonia-N | January 11, 1977 | 13 | 8 | 62% | Industrial & municipal discharges in Cedar Rapids |
| Cedar | Vinton to mouth | B(w) | pH | Sept. 13, 1976 | 13 | 3 | 23% | Natural causes |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - High

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Wolf Creek & Tributaries | Entire Length | B(w) | Fecal Coliform | June 14, 1976 | 14 | 14 | 100% | Non-point |
| Wolf Creek & Tributaries | Entire Length | B(w) | Barium | June 14, 1976 | 7 | 3 | 43% | Non-point |
| Wolf Creek & Tributaries | Entire Length | B(w) | Copper | June 14, 1976 | 7 | 5 | 71% | Non-point |
| Wolf Creek & Tributaries | Entire Length | B(w) | Lead | June 14, 1976 | 7 | 2 | 29% | Non-point |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Wolf Creek | Gladbrook to mouth | B(w) | pH | Sept. 22, 1976 | 4 | 1 | 25% | Natural causes |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Black Hawk Creek | Grundy Center to mouth | B(w) | Fecal Coliform | Sept. 22, 1976 | 7 | 5 | 71% | Point sources at Grundy Center, Reinbeck, & Hudson |
| Black Hawk Creek | Grundy Center to mouth | B(w) | Ammonia-N | Sept. 22, 1976 | 7 | 1 | 14% | Municipal discharge at Hudson |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Moderately Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Beaver Creek | Ackley to mouth | B(w) | Fecal Coliform | Sept 22, 1976 | 13 | 1 | 8% | Industrial & municipal discharges in Ackley |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Iowa-Cedar

FLOW - Moderate

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| West Fork Cedar River & Tributaries | Entire Length | B(w) | Fecal Coliform | June 21, 1976 | 16 | 2 | 12% | Municipal discharge at Hampton & non-point |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Des Moines

FLOW - Winter Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Des Moines | Humbolt to Des Moines | B(w) | Fecal Coliform | January 7, 1974 | 12 | 2* | 17%* | Municipal discharges in Fort Dodge |
| East Fork Des Moines | Entire Length | B(w) | Fecal Coliform | January 7, 1974 | 10 | 2* | 20%* | Municipal discharges upstream from Algona and at Algona |
| West Fork Des Moines | Entire Length | B(w) | Fecal Coliform | January 7, 1974 | 11 | 2* | 18%* | Municipal discharge at Estherville |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Skunk

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Skunk | Entire Length | B(w) | Fecal Coliform | Sept. 22, 1976 | 19 | 5 | 26% | Municipal discharges at and above Ames |
| Skunk | Entire Length | B(w) | Ammonia-N | Sept. 22, 1976 | 33 | 4 | 12% | Municipal discharge at Ames |
| Skunk | Entire Length | B(w) | Dissolved Oxygen | Sept. 22, 1976 | 33 | 1 | 3% | Municipal discharge at Ames |
| Skunk | Entire Length | B(w) | pH | Sept. 22, 1976 | 19 | 2 | 11% | Unknown |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Des Moines

FLOW - High

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| South Raccoon | Entire Length | B(w) | Fecal Coliform | April 27, 1976 | 8 | 8 | 100% | Non-point |
| Middle Racoon | Entire Length | B(w) | Fecal Coliform | April 27, 1976 | 11 | 7 | 64% | Non-point |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Des Moines

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| North Raccoon | Sac City to Des Moines | B(w) | Fecal Coliform | Sept. 23, 1976 | 1 | 1 | 100% | Feedlot runoff |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Des Moines

FLOW - Winter Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| North Raccoon | Entire Length | B(w) | Ammonia-N | January 24, 1977 | 14 | 4 | 29% | Industrial & municipal discharges at Perry |
| North Raccoon | Entire Length | B(w) | Dissolved Oxygen | January 24, 1977 | 14 | 6 | 43% | Municipal & industrial discharges at Jefferson & Perry |
| North Raccoon | Entire Length | B(w) | Fecal Coliform | January 24, 1977 | 14 | 7* | 50% | Municipal discharges along stream |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Des Moines

FLOW - Winter Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| North Raccoon | Entire Length | B(w) | Ammonia-N | January 24, 1977 | 14 | 4 | 29% | Industrial & municipal discharges at Perry |
| North Raccoon | Entire Length | B(w) | Dissolved Oxygen | January 24, 1977 | 14 | 6 | 43% | Municipal & industrial discharges at Jefferson & Perry |
| North Raccoon | Entire Length | B(w) | Fecal Coliform | January 24, 1977 | 14 | 7* | 50%* | Municipal discharges along stream |

## WATER QUALITY RELATIVE TO STANDARDS

### BASIN - Des Moines

### FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Boone | Entire Length | B(w) | Fecal Coliform | January 19, 1976 | 16 | 1* | 6% | Municipal discharge at Webster City |
| Boone | Entire Length | B(w) | Fecal Coliform | Sept. 22, 1976 | 16 | 2 | 12% | Municipal discharge at Corwith |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Southern

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| West Nishnabotna | Entire Length | B(w) | Fecal Coliform | January 31, 1977 | 11 | 1* | 9%* | Municipal discharges along entire length of stream |
| West Nishnabotna | Entire Length | B(w) | Ammonia-N | January 31, 1977 | 11 | 2 | 18% | Municipal discharge at Oakland |
| West Nishnabotna | Entire Length | B(w) | Dissolved Oxygen | January 31, 1977 | 11 | 3 | 27% | Municipal discharge at Harlan and Oakland |
| West Nishnabotna | Entire Length | B(w) | Fecal Coliform | Sept. 10, 1974 | 10 | 2 | 20% | Municipal discharge at Harlan |
| West Nishnabotna | Entire Length | B(w) | Fecal Coliform | January 21, 1975 | 10 | 2* | 20%* | Municipal discharge at Harlan |
| East Nishnabotna | Entire Length | B(w) | Fecal Coliform | Sept. 10, 1974 | 6 | 1 | 17% | Municipal discharge at Red Oak |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Southern (Continued)

FLOW - Low (Continued)

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| East Nodaway | Entire Length | B(w) | Fecal Coliform | January 14, 1975 | 4 | 1* | 25%* | Municipal discharge at Corning |
| Middle Nodaway | Entire Length | B(w) | Fecal Coliform | January 14, 1975 | 3 | 2* | 67%* | Small municipal discharges along length of the stream |
| West Nodaway | Entire Length | B(w) | Fecal Coliform | January 14, 1975 | 6 | 2* | 33%* | Municipal discharge at Clarinda |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Missouri

FLOW - **

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Missouri | Iowa Length | AB | Fecal Coliform | ** | 24 | 24* | 100%* | Point Sources |
| Missouri | Iowa Length | AB | Mercury | ** | 4 | 1 | 25% | Unknown |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Boyer | Entire Length | B(w) | Fecal Coliform | January 25, 1975 | 9 | 3* | 33%* | Municipal & industrial discharges in Denison |
| Boyer | Entire Length | B(w) | Ammonia-N | January 25, 1975 | 9 | 3 | 33% | Municipal & industrial discharges in Denison |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Boyer | Entire Length | B(w) | Ammonia-N | Sept. 26, 1976 | 9 | 2 | 22% | Municipal & industrial discharges in Denison |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Floyd | Entire Length | B(w) | Fecal Coliform | Sept. 14, 1976 | 10 | 4 | 40% | Municipal discharges at Sheldon, Alton and LeMars |
| Floyd | Entire Length | B(w) | Ammonia-N | Sept. 14, 1976 | 10 | 1 | 10% | Municipal discharges at Sheldon |
| West Branch Floyd River | Sioux Center to mouth | B(w) | Fecal Coliform | Sept. 14, 1976 | 4 | 2 | 50% | Municipal discharge at Sioux Center |
| Little Floyd | Entire Length | B(w) | Fecal Coliform | Sept. 14, 1976 | 2 | 2 | 100% | Municipal discharge at Sanborn |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western

FLOW - Above Average

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Little Sioux and Tributaries | Entire Length | B(w) | Fecal Coliform | May 25, 1976 | 26 | 12 | 33% | Municipal discharges along length of stream & non-point contributions |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western

FLOW - Moderately Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Maple River and Tributaries | Entire Length | B(w) | Fecal Coliform | January 12, 1976 | 19 | 8* | 42%* | Municipal discharges along entire stream |
| Maple River and Tributaries | Entire Length | B(w) | Dissolved Oxygen | January 12, 1975 | 19 | 2 | 11% | Municipal discharges along entire stream & ice cover |
| Maple River | Entire Length | B(w) | Fecal Coliform | January 6, 1975 | 11 | 1 | 9% | Municipal discharge below Ida Grove |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western

FLOW - Average

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Little Sioux and Tributaries | Entire Length | B(w) | Fecal Coliform | August 4, 1975 | 10 | 2 | 20% | Municipal discharges at Spencer and Turin |
| Little Sioux | Entire Length | B(w) | pH | August 4, 1975 | 10 | 1 | 10% | Natural causes |
| Little Sioux and Tributaries | Entire Length | B(w) | Fecal Coliform | October 14, 1975 | 23 | 3 | 13% | Municipal discharges at Spencer and non-point |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western

FLOW - Low

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Otter Creek | Entire Length | B(w) | Fecal Coliform | Sept. 23, 1976 | 2 | 2 | 100% | Municipal discharge at Sibley |
| Otter Creek | Entire Length | B(w) | Ammonia-N | Sept. 23, 1976 | 2 | 1 | 50% | Municipal discharge at Sibley |
| Otter Creek | Entire Length | B(w) | Dissolved Oxygen | Sept. 23, 1976 | 2 | 1 | 50% | Municipal discharge at Sibley |
| Little Rock River | Entire Length | B(w) | Fecal Coliform | Sept. 23, 1976 | 2 | 1 | 50% | Municipal discharges at Little Rock and George |
| Rock River | Entire Length | B(w) | Fecal Coliform | January 3, 1977 | 6 | 2* | 33%* | Municipal discharges at Rock Rapids and Rock Valley |
| Rock River | Entire Length | B(w) | Ammonia-N | January 3, 1977 | 6 | 1 | 17% | Municipal discharge at Rock Rapids |

## WATER QUALITY RELATIVE TO STANDARDS

BASIN - Western (Continued)

FLOW - Low (Continued)

| STREAM | SEGMENT | CLASS | PARAMETER | DATE OF SURVEY | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|---|
| Otter Creek | Entire Length | B(w) | Fecal Coliform | January 3, 1977 | 2 | 1* | 50%* | Municipal discharge at Sibley |
| Otter Creek | Entire Length | B(w) | Ammonia-N | January 3, 1977 | 2 | 1 | 50% | Municipal discharge at Sibley |
| Otter Creek | Entire Length | B(w) | Dissolved Oxygen | January 3, 1977 | 2 | 1 | 50% | Municipal discharge at Sibley |
| Little Rock River | Entire Length | B(w) | Dissolved Oxygen | January 3, 1977 | 2 | 1 | 50% | Municipal discharge at Rock Rapids & George, plus ice cover |

* Those waters which exceed the 2,000 org/100 ml standard in the summer. These are not violations per say, but may indicate problem areas.

** Monthly stations collected by U.S.G.S. where flow varies from one collection time to another.

## WATER QUALITY RELATIVE TO STANDARDS

## (QUARTERLIES)

### BASIN - Northeastern

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Maquoketa | Hwy 62 N.E. of Maquoketa | B(w) | Fecal Coliform | 6 | 5 | 83% | Municipal discharge at Maquoketa |
| Maquoketa | Hwy 62 N.E. of Maquoketa | B(w) | Fecal Coliform | 4 | 3* | 75%* | Municipal discharge at Maquoketa |
| Upper Iowa | Hwy 52 Bridge N. of Decorah | AB | Fecal Coliform | 8 | 1 | 12% | Non-point |

## WATER QUALITY RELATIVE TO STANDARDS

### (QUARTERLIES)

### BASIN - Iowa-Cedar

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Iowa | Marshalltown Waterworks | C | pH | 8 | 1 | 12% | Natural causes |
| Iowa | SUI-water plant | C | Copper | 8 | 4 | 50% | Unknown |
| Iowa | Hwy 61 Bridge N. of Wappelo | B(w) | Fecal Coliform | 8 | 1 | 12% | Municipal discharge upstream of sample |
| Cedar | Hwy 18 Bridge at Charles City | B(w) | Fecal Coliform | 8 | 2 | 25% | Municipal discharge upstream of sample |
| Cedar | 0.5 miles S.E. of Palo | B(w) | Fecal Coliform | 4 | 1 | 25% | Municipal discharge upstream of sample |
| Cedar | 0.5 miles S.E. of Palo | B(w) | Fecal Coliform | 4 | 1* | 25%* | Municipal discharge upstream of sample |

## WATER QUALITY RELATIVE TO STANDARDS

### (QUARTERLIES)

### BASIN - Skunk

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Skunk | Hwy 34 Bridge 6 mi. W. of Mt. Pleasant | B(w) | Fecal Coliform | 4 | 2 | 50% | Upstream point sources |
| Skunk | Hwy 34 Bridge 6 mi. W. of Mt. Pleasant | B(w) | Fecal Coliform | 4 | 1* | 25%* | Upstream point sources |
| Skunk | Hwy 34 Bridge 6 mi. W. of Mt. Pleasant | B(w) | Arsenic | 8 | 1 | 12% | Unknown |
| Skunk | Hwy 34 Bridge 6 mi. W. of Mt. Pleasant | B(w) | Copper | 8 | 1 | 12% | Unknown |

## WATER QUALITY RELATIVE TO STANDARDS

### (QUARTERLIES)

### BASIN - Des Moines

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Des Moines | Euclid Avenue Bridge | AB | Fecal Coliform | 14 | 4 | 29% | Municipal discharges upstream of sample |
| Des Moines | Euclid Avenue Bridge | AB | Fecal Coliform | 10 | 3* | 30%* | Municipal discharges upstream of sample |
| Des Moines | Hwy 46 Bridge at Des Moines | B(w) | Fecal Coliform | 10 | 5 | 50% | Municipal discharge at Des Moines |
| Des Moines | Hwy 46 Bridge at Des Moines | B(w) | Fecal Coliform | 14 | 7* | 50% | Municipal discharge at Des Moines |
| Des Moines | Hwy 46 Bridge at Des Moines | B(w) | Copper | 24 | 1 | 4% | Unknown |
| Des Moines | Ottumwa Water Works | C | Silver | 8 | 2 | 25% | Unknown |
| Des Moines | Hwy 61 Bridge S of Keokuk | AB | Fecal Coliform | 4 | 2 | 50% | Municipal discharges upstream of sample |
| Des Moines | Hwy 61 Bridge S of Keokuk | AB | Fecal Coliform | 4 | 2* | 50%* | Municipal discharges upstream of sample |

## WATER QUALITY RELATIVE TO STANDARDS

## (QUARTERLIES)

## BASIN - Des Moines (Continued)

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Des Moines | Hwy 61 Bridge S of Keokuk | AB | Arsenic | 8 | 1 | 12% | Unknown |
| Des Moines | Hwy 61 Bridge S of Keokuk | AB | Chromium | 8 | 1 | 12% | Unknown |
| Des Moines | Hwy 61 Bridge S of Keokuk | AB | Lead | 8 | 1 | 12% | Unknown |
| Des Moines | Hwy 61 Bridge S. of Keokuk | AB | Copper | 8 | 2 | 25% | Unknown |

## WATER QUALITY RELATIVE TO STANDARDS

## (QUARTERLIES)

## BASIN - Des Moines

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| East Fork Des Moines | Hwy 3 Bridge in Dakota City | B(w) | Dissolved Oxygen | 8 | 1 | 12% | Ice cover |
| East Fork Des Moines | Hwy 3 Bridge in Dakota City | B(w) | Fecal Coliform | 8 | 1* | 12%* | Municipal discharges upstream from sample |
| West Fork Des Moines | Hwy 169 Bridge at Humbolt | B(w) | Fecal Coliform | 8 | 1* | 12%* | Municipal discharges upstream from sample |

# WATER QUALITY RELATIVE TO STANDARDS

## (QUARTERLIES)

## BASIN - Southern

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Chariton | S.E. of Chariton | B(w) | Ammonia-N | 8 | 1 | 12% | Municipal discharge at Chariton |
| Chariton | S.E. of Chariton | B(w) | Dissolved Oxygen | 8 | 2 | 25% | Municipal discharge at Chariton |
| Chariton | S.E. of Chariton | B(w) | Fecal Coliform | 8 | 2* | 25%* | Municipal discharge at Chariton |
| Chariton | 2.5 mi. N. of Centerville | B(w) | Fecal Coliform | 8 | 1* | 12%* | Non-point |
| Chariton | 2.5 mi. N. of Centerville | B(w) | Lead | 8 | 1 | 12% | Unknown |
| East Fork 102 River | 6 mi. S.W. of Bedford | B(w) | Fecal Coliform | 8 | 2* | 25%* | Municipal discharge at Bedford |
| West Nodaway | 3 mi. S. of Shambaugh | B(w) | Fecal Coliform | 4 | 1 | 25% | Municipal discharge at Clarinda |
| West Nodaway | 3 mi. S. of Shambaugh | B(w) | Fecal Coliform | 4 | 4* | 100%* | Municipal discharge at Clarinda |

## WATER QUALITY RELATIVE TO STANDARDS

(QUARTERLIES)

BASIN - Southern (Continued)

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| West Nodaway | 3 mi. S. of Shambaugh | B(w) | Mercury | 8 | 1 | 12% | Unknown |
| Nishnabotna | Hwy 275 Bridge S.E. of Hamburg | B(w) | Fecal Coliform | 4 | 2 | 50% | Municipal discharges on stream |
| Nishnabotna | Hwy 275 Bridge S.E. of Hamburg | B(w) | Fecal Coliform | 4 | 3* | 75%* | Municipal discharges on stream |

# WATER QUALITY RELATIVE TO STANDARDS

## (QUARTERLIES)

## BASIN - Western

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Boyer | 2 mi. E. of Missouri Valley | B(w) | Fecal Coliform | 8 | 2* | 25%* | Upstream municipal discharges |
| Little Sioux | W of Spencer | B(w) | Fecal Coliform | 8 | 1* | 12%* | Municipal discharges in Great Lakes area |
| Little Sioux | W of Spencer | B(w) | Lead | 8 | 1 | 12% | Unknown |
| Little Sioux | Hwy 175 Bridge Near Turin | B(w) | Fecal Coliform | 4 | 2 | 50% | Municipal discharges upstream of sample |
| Little Sioux | Hwy 175 Bridge Near Turin | B(w) | Fecal Coliform | 4 | 1* | 25%* | Municipal discharges upstream of sample |
| Little Sioux | Hwy 175 Bridge Near Turin | B(w) | Ammonia-N | 8 | 1 | 12% | Municipal discharges upstream of sample |
| Little Sioux | Hwy 175 Bridge Near Turin | B(w) | Copper | 8 | 1 | 12% | Unknown |
| Floyd | 3 miles N. of Sioux City | B(w) | Dissolved Oxygen | 8 | 1 | 12% | Municipal discharge at LeMars |

# WATER QUALITY RELATIVE TO STANDARDS

## (QUARTERLIES)

## BASIN - Western (Continued)

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Floyd | 3 miles N. of Sioux City | B(w) | Fecal Coliform | 8 | 2* | 25%* | Municipal discharge at LeMars |
| Floyd | 3 miles N. of Sioux City | B(w) | Copper | 8 | 1 | 12% | Unknown |
| Big Sioux | Hwy Bridge N.W. of Akron | B(w) | Ammonia-N | 8 | 1 | 12% | Municipal discharges in South Dakota |
| Big Sioux | Hwy Bridge N.W. of Akron | B(w) | Dissolved Oxygen | 8 | 1 | 12% | Municipal discharges in South Dakota |
| Big Sioux | Hwy Bridge N.W. of Akron | B(w) | Fecal Coliform | 8 | 1* | 12%* | Municipal discharges in South Dakota |

# WATER QUALITY RELATIVE TO STANDARDS

(QUARTERLIES)

BASIN - Western

| STREAM | STATION | CLASS | PARAMETER | NO. OF SAMPLES | NO. OF VIOLATIONS | PERCENT VIOLATIONS | SOURCES OF PROBLEMS |
|---|---|---|---|---|---|---|---|
| Rock | 0.25 miles above mouth | B(w) | Fecal Coliform | 8 | 2* | 25%* | Upstream municipal disharges |
| Rock | 0.25 miles above mouth | B(w) | Copper | 8 | 1 | 12% | Unknown |
| Missouri | Hwy 77 Bridge Sioux City | AB | Fecal Coliform | 4 | 2 | 50% | Affected by Big Sioux |
| Missouri | Hwy 77 Bridge Sioux City | AB | Fecal Coliform | 4 | 1* | 25%* | Affected by Big Sioux |

* Those samples which exceed the summer standard for fecal coliform and do not constitute a violation, but may be problem areas.

# APPENDIX A-3

# DISCHARGE INVENTORIES

# NORTHEASTERN

# DISCHARGE INVENTORY

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | DISCHAR DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Chester | M | Upper Iowa | - | 0.020 | controlled discharge | - | - |
| Lime Springs | M | Millers Creek | $BOD_5$<br>$NH_3$ | 0.096 | 30 mg/1<br>15 mg/1 | Step 3 + 15 mo. | - |
| Cresco | M | Silver Creek | $BOD_5$<br>$NH_3$ | 0.380 | 10 mg/1<br>2 mg/1 | 2/1/79 | - |
| Farmers Coop Creamery, Cresco | I | Silver Creek | - | 0.120 | - | - | To municipal STP |
| Howard Co. Home, Cresco | S | Silver Creek | - | 0.006 D | - | - | Lagoons |
| Ridgeway | M | Walnut Creek | - | 0.020 | controlled discharge | - | - |
| Ridgeway Dairy | I | Walnut Creek | - | 0.009 | - | - | No discharge |
| Decorah | M | Upper Iowa | $BOD_5$<br>$NH_3$ | 1.59 | 10 mg/1<br>2 mg/1 | Step 3 + 21 mo | - |
| Luther College, Decorah | S | Upper Iowa | - | - | - | - | To municipal STP |
| State Conservation Comm., Decorah Fish Hatchery | S | Upper Iowa | - | - | - | - | No discharge |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | DISCHAR DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Deco Products Co., Decorah | I | Upper Iowa | - | 0.081 D | - | - | Cooling water |
| Winneshiek Co. Home, Decorah | S | Upper Iowa | - | - | - | - | Septic tank |
| Farmers' Coop. Creamery, Decorah | I | Upper Iowa | - | 0.002 D | - | - | - |
| Allamakee Community School, Dorchester | S | Upper Iowa | - | - | - | - | - |

# DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| New Albin | M | Mississippi | $BOD_5$<br>$NH_3$ | 0.056 E | 30 mg/1<br>15 mg/1 | - | - |
| Lansing | M | Mississippi | $BOD_5$<br>$NH_3$ | 0. 162 E | 30 mg/1<br>15 mg/1 | - | - |
| Interstate Power Co. | I | Mississippi | - | 43 D | - | - | Cooling water |
| Interstate Power Co. | I | Mississippi | TSS | 0.06 D | 30 mg/1 | - | Ash settling pond |
| Interstate Power Co. | I | Mississippi | TSS | 0.005 D | 30 mg/1 | - | WTP |
| Interstate Power Co. | I | Mississippi | TSS<br>$BOD_5$<br>Zn<br>Phenol<br>Cr | 0.001 D | 30 mg/1<br>>6 mg/1<br>70 ug/1<br>3 ug/1<br>40 ug/1 | - | Cool hopper sump discharge |
| Harpers Ferry | M | Mississippi | - | 0.066 | Controlled discharge | - | - |
| Waukon | M | Paint Creek | $BOD_5$<br>$NH_3$ | 0.900 | 30 mg/1<br>1.5 mg/1 | 7/1/79 | - |
| Alamakee Co. Church Camp | S | Paint Creek | - | - | - | - | Lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Meadowland Dairy Assn., Waukon | I | Paint Creek | $BOD_5$ | 0.120 D | 4 mg/1 | - | Cooling water |
| Cooney Const. Co., Waukon | I | Paint Creek | TSS | 0.10 D | 30 mg/1 | - | - |
| Waterville | M | Paint Creek | - | - | - | - | Septic tanks |
| Farmers Coop. Creamery, Waterville | I | Paint creek | - | 0.001 D | - | - | Cooling water |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Ludlow Community Dairy, Waukon | I | Yellow River | - | - | - | - | Spray irrigation |
| Voloney Cheese Co., Allamakee County | I | Yellow River | - | 0.018 D | - | - | - |
| Postville | M | Williams Creek | $BOD_5$<br>$NH_3$ | 0.258 | 30 mg/1<br>15 mg/1 | Step 3 + 21 mo. | - |
| Postville Industrial Lagoon | I | Williams Creek | - | 0.485 | - | - | - |
| Norplex Div. UOP, Postville | I | Williams Creek | $BOD_5$<br>$NH_3$ | 0.500 D | 4 mg/1<br>0.1 mg/1 | - | - |
| Luana | M | Hickory Creek | - | 0.038 | Controlled discharge | - | - |
| Mississippi Valley Milk Producers Assn., Luana | I | Hickory Creek | $BOD_5$<br>$NH_3$ | 0.180 D | 10 mg/1<br>2 mg/1 | - | - |
| Marquette | M | Mississippi | $BOD_5$ | 0.085 | 30 mg/1 | 10/1/77 | - |
| Chicago, Milwaukee, St. Paul, & Pacific R.R., Marquette | I | Bloody Run Creek | - | 0.003 | - | - | Drainage from fueling facilities and enginehouse inspection pits |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| McGregor | M | Mississippi | $BOD_5$ | 0.106 | 30 mg/1 | Step 3 + 15 mo | - |
| Clayton | M | Mississippi | - | - | - | - | Septic tanks |
| Guttenburg | I | Miners Creek | $BOD_5$<br>$NH_3$ | 0.327 E | 30 mg/1<br>15 mg/1 | Step 3 + 15 mo. | - |
| Schley Cheese Co., Cresco | I | Turkey River | - | 0.913 mgy D | - | - | - |
| Protivin | M | Bohemian Creek | - | 0.033 | Controlled discharge | 2/1/78 | - |
| Spillville | M | Turkey River | - | 0.036 | Controlled discharge | 11/1/79 | - |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Calmar STP | M | Unnamed Creek | $BOD_5$<br>$NH_3$ | 0.103 | 30 mg/1<br>15 mg/1 | - | - |
| Calmar WTP | S | Unnamed Creek | - | - | - | - | Iron filter backwash |
| Fort Atkinson | M | Turkey River | - | 0.034 | Controlled discharge | - | - |
| St. Lucas | M | Turkey River | - | 0.022 | Controlled discharge | - | - |
| Carson Materials Co., Schley | I | Little Turkey | - | - | - | - | - |
| Lawler | M | Crane Creek | - | 0.058 | Controlled discharge | - | - |
| Welp & McCarten Inc., Lawler | I | Crane Creek | - | - | - | - | Quarry dewatering |
| Jackson Jctn. | M | Crane Creek | - | - | - | - | Septic tanks |
| Turkey Valley School, Jackson Junction | S | Crane Creek | - | 0.024 D | - | - | - |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Waucoma | M | Crane Creek | - | 0.040 | Controlled discharge | - | - |
| Ossian | M | Nutting Creek | $BOD_5$<br>$NH_3$ | 0.076 | 10 mg/1<br>2 mg/1 | Step 3 + 15 mo. | - |
| Castalia | M | Unnamed Tributary | - | 0.021 | Controlled discharge | - | - |
| Clermont | M | Turkey River | $BOD_5$ | 0.038 | 30 mg/1 | Step 3 + 15 mo. | - |
| Paul Nieman Const. Co., (Olson Sand Pit) | I | Turkey River | - | - | - | - | Closed system. Not used since 1968. |
| Jacobson Quarry | I | Turkey River | - | - | - | - | - |
| West Union | M | Otter Creek | $BOD_5$<br>$NH_3$ | 0.149 | 10 mg/1<br>2 mg/1 | Step 3 + 15 mo. | - |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Elgin | M | Turkey River | $BOD_5$<br>$NH_3$ | 0.058 E | 30 mg/1<br>15 mg/1 | - | - |
| Elgin Canning Co., Elgin | I | Turkey River | - | - | - | - | Irrigation fields and tile |
| Elkader | M | Turkey River | $BOD_5$ | 0.145 | 30 mg/1 | Step 3 + 15 mo. | - |
| Riemets Add'n., Elkader | S | Turkey River | - | 0.004 | - | - | Lagoons |
| Mid-America Dairymen, Inc., Elkader | I | Turkey River | - | 0.01 | - | - | Pretreatment plan proposed to Elkader STP |
| Culligan Water Cond., Elkader | I | Turkey River | - | - | - | - | Septic tanks |
| Big Spring Trout Hatchery, Elkader | S | Turkey River | - | 6.90 D | - | - | - |
| Monona | M | Roberts Creek<br>Silver Creek | $BOD_5$<br>$NH_3$ | 0.147 | 10 mg/1<br>2 mg/1 | Step 3 + 15 mo. | - |
| Farmersburg | M | Roberts Creek | - | 0.20 | Controlled discharge | - | - |
| St. Olaf | M | Roberts Creek | - | - | - | - | - |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Clayton Co. Home | S | Roberts Creek | - | - | - | - | Lagoon |
| Hawkeye | M | North Branch Volga River | $BOD_5$<br>$NH_3$ | 0.059 E | 10 mg/1<br>2 mg/1 | Step 3 + 15 mo. | - |
| Paul Neimann Const. Co. (Gifford Sand Pit) | I | North Branch Volga River | - | - | - | - | Closed system lagoon |
| Maynard | M | Little Volga River | $BOD_5$<br>$NH_3$ | 0.057 E | 30 mg/1<br>15 mg/1 | - | - |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Maynard Quarry (Hewitt Bros., Inc.) | I | Little Volga River | - | 0.075 D | - | - | Quarry dewatering |
| Randalia | M | Volga River | - | - | - | - | No treatment |
| Donnan | M | Volga River | - | - | - | - | No treatment |
| Fayette | M | Volga River | $BOD_5$<br>$NH_3$ | 0.371 E | 30 mg/1<br>11 mg/1 | - | - |
| Fayette Co. Home | S | Volga River | - | 0.010 D | - | - | Lagoon |
| Wadena | M | Volga River | - | 0.026 E | Controlled discharge | - | - |
| Wadena Cheese and Butter Co. | I | Volga River | - | 0.004 D | - | - | Spray Irrigation |
| Paul Niemann Const. Co. (Yearons Sand Pit) | I | Volga River | - | - | - | - | Closed system lagoon |
| Arlington | M | Brush Creek | $BOD_5$<br>$NH_3$ | 0.055 | 19 mg/1<br>4 mg/1 | 8/1/79 | - |
| Volga | M | Volga River | - | 0.035 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Strawberry Point | M | Spring Creek | - | 0.241 | Controlled discharge | - | - |
| Starmont Senior High School, Strawberry Point | S | Spring Creek | - | - | - | - | Lagoon |
| Littleport | M | Volga River | - | - | - | - | No treatment |
| Edgewood | M | Bear Creek | $BOD_5$<br>$NH_3$ | 0.097 E | 10 mg/1<br>2 mg/1 | Step 2 + 15 mo. | - |
| Elkport | M | Volga River | - | - | - | - | No treatment |
| Garber | M | Turkey River | - | - | - | - | No treatment |
| Gunder Cheese Factory, Gunder | I | Turkey River | - | - | - | - | Spray irrigation |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Garnavillo STP | M | South Cedar Creek | $BOD_5$<br>$NH_3$ | 0.040 | 10 mg/1<br>2 mg/1 | 1/1/79 | - |
| Garnavillo WTP | S | South Cedar Creek | - | - | - | - | Backwast water to municipal STP |
| Martin Marietta Corp. | I | South Cedar Creek | - | 0.400 D | - | - | Discharge from air scrubbers. |
| Osterdock | M | Turkey River | - | - | - | - | No treatment |
| Colesburg (SE) | M | Little Turkey River | - | 0.018 | Controlled discharge | - | - |
| Colesburg (NW) | M | Little Turkey River | - | 0.019 | Controlled discharge | - | - |
| Millville | M | Little Turkey River | - | - | - | - | No treatment |
| North Buena Vista | M | Mississippi | - | - | - | - | No treatment |
| Balltown | M | Mississippi | - | - | - | - | No treatment |
| Sherrill East | M | Bloody Run Creek | - | 0.037 | Controlled discharge | - | - |
| Sherrill South | M | Bloody Run Creek | - | 0.037 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Richardville | M | Middle Fork Little Maquooketa River | - | 0.038 | Controlled discharge | - | - |
| Durango | M | Little Maquoketa River | - | - | - | - | No treatment |
| Bankston | M | Little Maquoketa River | - | - | - | - | No treatment |
| Farley | M | Little Maquoketa River | - | 0.213 E | Controlled discharge | Step 3 + 15 mo. | - |
| Graf | M | Little Maquoketa River | - | - | - | - | No treatment |
| Sageville | M | Little Maquoketa River | - | 0.066 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Valley Hill Mobile Home Ct., Sageville | S | Little Maquoketa River | - | - | - | - | - |
| Sundown Ski Area, Dubuque County | S | Little Maquoketa River | - | 0.001 | - | - | Lagoon |
| Dubuque | M | Mississippi | $BOD_5$<br>$NH_3$ | 9.8 | 30 mg/1<br>15 mg/1 | - | - |
| Dubuque WTP | S | Mississippi | - | 0.011 D | - | - | Discharge to Mississippi via flood detention basin |
| Caradco Div., Dubuque | I | Mississippi | - | 0.715 D | - | - | Cooling water; all process wastes to Dubuque STP |
| Fisher Inc., Dubuque | I | Mississippi | - | 0.648 D | - | - | Cooling water |
| Interstate Power Co., Dubuque | I | Mississippi | - | 61.1 D | - | - | Cooling water; all process wastes to Dubuque STP |
| Keystone Gelatin Company, Dubuque | I | Mississippi | - | 0.756 D | - | - | Cooling water; all process wastes to Dubuque STP |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Midland Laboratories, Inc., Dubuque | I | Mississippi | - | 0.003 D | - | - | Cooling water; all process waste to Dubuque STP |
| U.S. Industrial Chemical Co., Dubuque | I | Mississippi | - | 2.31 D | - | - | Cooling water |
| Dubuque Stamping & Manufacturing Co., Dubuque | I | Mississippi | - | 0.69 | - | - | 0.42 mgd to Dubuque STP; 0.27 mgd to storm sewer |
| Mole Sand & Gravel Co., Dubuque | I | Mississippi | - | - | - | - | No treatment |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Twin Ridge Subdivision, Dubuque | S | Mississippi | - | - | - | - | Temporary lagoon; may be diverted to Dubuque STP |
| Maple Hills Subdivision, Dubuque | S | Mississippi | - | - | - | - | To Dubuque STP |
| Knapp Mobile Home Park #4, Dubuque | S | Mississippi | - | - | - | - | Septic tanks |
| Granada Gardens Mobile Home Park, Dubuque | S | Mississippi | - | - | - | - | Lagoon |
| Westgate Mobile Home Park, Dubuque | S | Mississippi | - | - | - | - | Activated sludge |
| Light Trailer Court, Dubuque | S | Mississippi | - | - | - | - | Septic tank |
| Table Mound Trailer Court No. 2, Dubuque | S | Mississippi | - | - | - | - | Activated sludge |
| Dubuque Co. Home, Dubuque | S | Mississippi | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| John Deere & Co., Dubuque | I | Little Maquoketa River | BOD<br>Zn<br>Phenols<br>Chromium | 31.93 | 1242 lbs.<br>28 lbs.<br>4.13 lbs.<br>1.45 lbs. | - | Primary treatment & polishing lagoons |
| Lore mobile Homes Park, Dubuque | S | Little Maquoketa River | - | - | - | - | Lagoon |
| Flesxteel Industries, Inc., Dubuque | I | Little Maquoketa River | - | 0.002 D | - | - | Cooling water |
| American Oil Co., Dubuque | I | Catfish Creek | - | - | - | - | - |
| Dubuque Sand & Gravel, Dubuque | I | Catfish Creek | - | - | - | - | Quarry water |
| Twin "T" Mobil Home Park, Dubuque | S | Catfish Creek | - | - | - | - | Lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Table Mound Mobile Home Ct., Dubuque | S | Catfish Creek | - | - | - | - | Aerated Lagoon |
| Deckert Mobile Home Park, Dubuque | S | Catfish Creek | - | - | - | - | Septic tank |
| Centralia | M | Catfish Creek | - | 0.20 | Controlled discharge | - | - |
| Peosta | M | Catfish Creek | - | 0.23 | Controlled discharge | - | - |
| Lost Canyon Mobile Home Park | S | Catfish Creek | - | - | - | - | - |
| Naval Reserve Center, Dubuque | S | Catfish Creek | - | - | - | - | 2 Septic tanks to 2 cell lagoon |
| St. Donatus | M | Tete des Morts Creek | - | 0.22 E | Controlled discharge | - | - |
| Bellevue STP | M | Mississippi | $BOD_5$<br>$NH_3$ | 0.31 E | 30 mg/l<br>15 mg/l | - | - |
| Bellevue WTP | S | Mississippi | - | - | - | - | To city STP |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Spring Valley Mobile Home Park, Bellevue | S | Mississippi | - | - | - | - | Trickling filter |
| Bellevue State Park | S | Mississippi | - | 0.06 D | - | - | Lagoon |
| Associated Milk Producers, Inc., Arlington | I | Maquoketa River | BOD<br>$NH_3$ | 0.395 D | 66 lbs.<br>20 lbs. | - | Lagoon |
| Lamont | M | Lamont Creek | - | 0.056 E | Controlled discharge | - | - |
| Paul Niemann Const. Co., (Ward Sand Pit) | I | Lamont Creek | - | - | - | - | Quarry water |
| Paul Niemann Const. Co., (Falck Quarry) | I | Maquoketa River | - | - | - | - | Not used |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Dundee | M | Maquoketa River | - | 0.21 | Controlled discharge | - | - |
| Martin Marietta (Walston Quarry) | I | Coffin Creek | - | 0.050 D | - | - | Quarry water from limestone production |
| Masonville | M | Prairie Creek | - | 0.20 | Controlled discharge | - | - |
| Martin Marietta Co. (Beaman Sand) | I | Honey Creek | - | 0.050 D | - | - | Wash water from sand production |
| Farmers Coop. Creamery, Greeley | I | Honey Creek | - | 0.002 D | - | - | Cooling water to creek |
| Prestolite, Manchester | I | Honey Creek | Lead | 0.060 | .5 mg/1 | - | - |
| Manchester | M | Maquoketa River | $BOD_5$<br>$NH_3$ | 0.581 | 30 mg/1<br>15 mg/1 | 11/1/78 | - |
| Manchester Hide Processng | I | Maquoketa River | - | - | - | - | To Waterloo & Davenport STP |
| Delhi | M | Maquoketa River | - | 0.024 | Controlled discharge | - | - |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Greeley | M | Plum Creek | - | 0.041 E | Controlled discharge | - | - |
| Oneida | M | Plum Creek | - | - | - | - | Septic tanks |
| Earlville | M | Plum Creek | $BOD_5$ | 0.053 | 30 mg/1 | Step 3 + 15 mo | - |
| Delaware | M | Plum Creek | - | - | - | - | Septic tanks |
| Ryan | M | Buck Creek | $BOD_5$<br>$NH_3$ | 0.207 | 10 mg/1<br>4 mg/1 | - | - |
| Associated Milk Producers, Inc., Ryan | I | Buck Creek | - | 0.145 | - | - | To city STP 0.070 mgd. Cooling water to creek. |
| Hopkinton | M | Maquoketa River | $BOD_5$<br>$NH_3$ | 0.177 | 30 mg/1<br>15 mg/1 | - | - |

# DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Mississippi Valley Milk Producers, Hopkinton | I | Maquoketa River | - | 0.035 D | - | - | Aerated holding pond prior to discharge to city STP. Cooling water river |
| Monticello Quarry | I | Wet Creek | - | 0.600 D | - | - | Dewatering and quarry water |
| Monticello | M | Maquoketa River | $BOD_5$ | 0.490 | 30 mg/1 | 3/1/79 | - |
| Jackson County Home | S | Farmers Creek | - | 0.007 D | - | - | Septic tank |
| Center Jctn. | M | Mineral Creek | - | 0.020 | Controlled discharge | - | - |
| Jones County Home | S | Mineral Creek | - | - | - | - | Lagoon |
| Onslow | M | Bear Creek | - | 0.008 | Controlled discharge | - | 2 cell lagoon |
| Wyoming | M | Bear Creek | - | 0.054 | Controlled discharge | Step 3 + 15 mo. | 2 cell lagoon |
| Baguss Quarry | I | Bear Creek | - | 0.015 D | - | - | Intermittent dewatering to keep quarry dry |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Monmouth | M | Bear Creek | - | 0.035 | Controlled discharge | - | - |
| Baldwin | M | Bear Creek | - | 0.023 E | Controlled discharge | - | - |
| Holy Cross | M | Dry Run | - | 0.020 | Controlled discharge | - | Lagoon |
| Luxemburg | M | North Fork Maquoketa River | - | 0.036 | Controlled discharge | - | - |
| New Vienna | M | North Fork Maquoketa River | $BOD_5$ | 0.024 | 30 mg/1 | Step 3 + 15 mo. | - |
| Dyersville | M | Unnamed Creek | $BOD_5$ | 0.442 | 30 mg/1 | - | - |
| Dyersville Ready Mix | I | Unnamed Creek | - | - | - | - | Settling pond |
|  |  | River |  |  |  |  |  |
| Worthington | M | Durian Brook | $BOD_5$<br>$NH_3$ | 0.029 | 30 mg/1<br>15 mg/1 | Step 3 + 15 mo. | - |
| Cascade | M | North Fork Maquoketa River | $BOD_5$ | 0.225 E | 30 mg/1 | Step 3 + 15 mo. | - |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Welding Quarries | I | North Fork Maquoketa River | - | 0.014 D | - | - | 2 settling ponds |
| Rockdale Stone Quarries | I | North Fork Maquoketa River | - | - | - | - | No treatment |
| Epworth | M | Whitewater Creek | $BOD_5$<br>$NH_3$ | 0.123 | 30 mg/1<br>15 mg/1 | Step 3 + 15 mo. | - |
| Bernard | M | Lytle Creek | - | 0.029 | Controlled discharge | - | - |
| Zwingle | M | Otter Creek | - | - | - | - | Septic tanks |
| LaMotte | M | Farmers Creek | - | 0.040 | Controlled discharge | - | - |
| Andrew | M | Cedar Creek | - | 0.024 | Controlled discharge | - | No needs |
| Andrew Quarry | I | Cedar Creek | - | - | - | - | Settling basins |
| Clinton Engines Corp., Maquoketa | I | North Fork Maquoketa River | - | 0.057 | - | - | Cooling water |
| Hurstville | M | Maquoketa River | - | - | - | - | Septic tanks |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Maquoketa | M | Maquoketa River | $BOD_5$<br>$NH_3$ | 0.752 | 20 mg/1<br>15 mg/1 | 1/1/80 | - |
| Martin Marietta (Rossow Quarry) | I | Maquoketa River | - | 0.050 D | - | - | Quarry water from limestone production |
| Springbrook | M | Unnamed Creek | - | 0.027 E | Controlled discharge | - | - |
| Charlotte | M | Deep Creek | - | 0.076 | Controlled discharge | - | No needs- |
| F. J. Trenkamp Quarry | I | Deep Creek | - | - | - | - | No treatment |
| Clinton County Home | S | Deep Creek | - | - | - | - | Unknown |
| Goose Lake | M | Deep Creek | - | 0.025 E | Controlled discharge | - | - |
| Delmar | M | Deep Creek | - | 0.069 | Controlled discharge | - | No needs- |
| Preston | M | Copper Creek | - | 0.320 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Copper Creek Village Mobile Home Park | S | Copper Creek | - | 0.007 D | - | - | 2 cell lagoon |
| Spragueville | M | Deep Creek | $BOD_5$<br>$NH_3$ | 0.013 | 30 mg/1<br>15 mg/1 | - | No needs |
| Green Island | M | Maquoketa River | - | - | - | - | Septic tanks |
| Sabula | M | Mississippi | $BOD_5$ | 0.078 | 30 mg/1 | 6/1/78 | - |
| Miles | M | Elk River | $BOD_5$<br>$NH_3$ | 0.039 | 20 mg/1<br>7 mg/1 | 12/1/78 | - |
| Andover | M | Elk River | - | 0.006 | Controlled discharge | - | - |
| Clinton | M | Beaver Channel | $BOD_5$ | 7.5 | 30 mg/1 | - | No needs |
| Elk River Mobile Estates, Clinton | S | Beaver Channel | - | - | - | - | Lagoon |
| Swift Dairy & Poultry, Clinton | I | Beaver Channel | - | 0.150 D | - | - | Cooling water |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| National By-Products, Clinton | I | Beaver Channel | - | 1.76 D | - | - | Cooling water |
| Clinton Corn Processing, Clinton | I | Beaver Channel | BOD | 53.5 | 5,000 lbs. | - | - |
| E. I. DuPont Nemours, Clinton | I | Beaver Channel | BOD<br>COD | 12.0 D | 2,300 lbs.<br>14,000 lbs. | - | Cooling and process wastewater |
| Sethness Products Co., Clinton | I | Beaver Channel | - | 0.127 D | - | - | Cooling water |
| Waukesha Motor Co., Clinton | I | Beaver Channel | - | 0.008 D | - | - | Cooling water |
| Continental Oil Co., Clinton | I | Beaver Channel | - | 0.005 D | - | - | Cooling water |
| Hawkeye Chemical, Clinton | I | Beaver Channel | $NH_3$<br>Organic - N<br>$NO_3$ - N | 1.85 D | 588 lbs.<br>109 lbs.<br>383 lbs. | - | 25% process water; 75% cooling water |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Union Carbide Clinton | I | Beaver Channel | - | - | - | - | To Clinton STP |
| Chemplex Co., Clinton | I | Beaver Channel | COD<br>Chromium<br>Zn | 1.60 | 2,500 lbs.<br>1.74 lbs.<br>8.0 lbs. | ? | Acitvated sludge plant with polishing pond |
| Interstate Power, Clinton | I | Mill Creek | - | 001 = 13 D<br>002 = 78 D<br>003 = 2.00 D<br>004 = 0.012 D<br>005 = 0.002 D | - | - | 001 = cooling water.<br>002 = cooling water.<br>003 = fly ash pond .<br>004 = emergency setling pond. 005 = coal hopper sump. |
| International Paper, Clinton | I | Mill Creek | - | 0.008 D | - | - | Cooling water |
| Collis Co., Clinton | I | Mill Creek | Chromium<br>Cyanide<br>Zn | .437 | 1.2 lbs.<br>1.3 lbs.<br>1.8 lbs. | - | Plating waste |
| Oakvale Subdivision, Clinton | I | Mill Creek | - | - | - | - | Activated sludge with polishing pond |
| Chicago & Northwestern R.R., Clinton | I | Mill Creek | - | 0.020 D | - | - | Septic tank |
| Oxbow Estates Mobile Home Park, Clinton | S | Unnaned Tributary | - | - | - | - | Lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Camanche STP | M | Swan Slough | $BOD_5$ | 0.833 E | 20 mg/1 | - | - |
| Camanche WTP, | S | Swan Slough | - | - | - | - | - |
| Central Steel Co.. | I | Swan Slough | - | - | - | - | discharges to Camanche STP |
| Low Moor | M | Rock Creek | - | 0.039 E | Controlled discharge | Step 3 + 15 mo. | - |
| McIntire | M | Wapsipinicon River | - | 0.023 | Controlled discharge | - | - |
| Riceville | M | Wapsipinicon River | - | 0.140 | Controlled discharge | - | - |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Welp & McCarten, Inc. | I | Wapsipinicon | - | - | - | - | Quarry water |
| Ionia | M | Drainage Ditch | - | 0.036 | Controlled discharge | - | - |
| Elma | M | Little Wapsipinicon River | $BOD_5$<br>$NH_3$ | 0.068 | 30 mg/1<br>15 mg/1 | | No needs |
| Alta Vista | M | Elk Creek | $BOD_5$ | 0.017 | 30 mg/1 | Step 3 + 15 mo. | - |
| Farmers Coop. Creamery, Alta Vista | I | Elk Creek | - | - | - | - | Closed |
| North Washington | M | Little Wapsipinicon River | - | - | - | - | No treatment |
| New Hampton | M | Spring Creek | $BOD_5$<br>$NH_3$ | 0.784 | 30 mg/1<br>2 mg/1 | 11/1/79 | - |
| Buckendahl Trailer Ct., New Hampton | S | Spring Creek | - | - | - | - | Septic tank |
| Chickasaw Co. Home | S | Spring Creek | - | - | - | - | Unknown |
| Frederika | M | Wapsipinicon River | - | 0.021 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Martin Marietta Corp. (Frederika Quarry) | I | Wapsipinicon River | - | 0.850 D | - | - | Quarry water |
| Tripoli | M | Wapsipinicon River | - | 0.123 | Controlled discharge | - | - |
| Grand Vu Acres Mobile Home Park, Tripoli | S | Wapsipinicon River | - | - | - | - | Activated sludge with polishing lagoon |
| Fredericksburg | M | East Fork Wapsipinicon River | $BOD_5$<br>$NH_3$ | 0.210 | 10 mg/1<br>5 mg/1 | 5/1/79 | - |
| Meinerz Creamery, Fredericksburg | I | East Fork Wapsipinicon River | BOD<br>$NH_3$ | 0.402 | 29 lbs.<br>9 lbs. | - | Bio disc plant with polishing lagoons |
| Farmers Butter & Dairy Coop., Fredericksburg | I | East Fork Wapsipinicon River | - | - | - | - | To Fredericksburg STP |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Readlyn | M | Drainage Ditch #5 | $BOD_5$<br>$NH_3$ | 0.076 | 10 mg/1<br>2 mg/1 | Step 3 + 15 mo. | - |
| Dunkerton | M | Crane Creek | - | 0.087 E | Controlled discharge | - | - |
| Sumner | M | Little Wapsipinicon River | $BOD_5$<br>$NH_3$ | 0.141 | 30 mg/1<br>9 mg/1 | 8/1/79 | - |
| Westgate | M | Little Wapsipinicon River | - | 0.023 | Controlled discharge | - | - |
| Fairbank | M | Little Wapsipinicon River | - | 0.091 E | Controlled discharge | Step 3 + 15 mo. | - |
| Paul Neiman Const. Co. | I | Little Wapsipinicon River | - | - | - | - | No treatment |
| Oelwein | M | Otter Creek | $BOD_5$<br>$NH_3$ | 1.69 | 20 mg/1<br>10 mg/1 | - | - |
| Hancor of Iowa, Oelwein | I | Otter Creek | - | 0.005 D | - | - | Cooling water |
| Lakeview Mobile Home Court, Oelwein | S | Otter Creek | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Chicago, NW R.R. Co., Oelwein | I | Otter Creek | - | 0.750 | - | - | Sanitary wastes to municipal STP |
| Hewitt Bros., Inc., (Oelwein Quarry) | I | Otter Creek | - | - | - | - | Quarry dewatering |
| Donaldson Co., Oelwein | I | Otter Creek | - | 0.028 D | - | - | Cooling water |
| Hazelton | M | Otter Creek | $BOD_5$<br>$NH_3$ | 0.050 | 30 mg/1<br>15 mg/1 | - | - |
| Independence | M | Wapsipinicon River | $BOD_5$<br>$NH_3$ | 1.29 | 30 mg/1<br>6 mg/1 | 9/1/80 | - |
| Mental Health Institute, Independence | S | Wapsipinicon River | - | 0.150 D | - | - | Trickling Filter |
| Independence Mobile Home Park | S | Wapsipinicon River | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Pine Ridge Mobile Home Park | S | Wapsipinicon River | - | - | - | - | Lagoon |
| Buchanan Co. Home | S | Wapsipinicon River | - | - | - | - | Septic tanks |
| Winthrop STP | M | Pine Creek | $BOD_5$<br>$NH_3$ | 0.071 | 30 mg/1<br>15 mg/1 | Step 3 + 15 mo. | - |
| Winthrop WTP | S | Pine Creek | - | - | - | - | To city STP |
| Baver Mink Farm, Winthrop | I | Pine Creek | - | - | - | - | Septic tanks |
| Quasqueton | M | Wapsipinicon River | $BOD_5$<br>$NH_3$ | 0.052 E | 30 mg/1<br>15 mg/1 | - | - |
| Troy Mills | M | Wapsipinicon River | $BOD_5$ | 0.014 | 30 mg/1 | 11/1/78 | - |
| Rowley | M | Sand Creek | - | 0.015 | Controlled discharge | Step 3 + 15 mo. | - |
| Cono Center Bible Presbyterian Church, Walker | S | Sand Creek | - | - | - | - | Lagoon |
| Central City | M | Wapsipinicon River | $BOD_5$<br>$NH_3$ | 0.045 | 30 mg/1<br>15 mg/1 | - | - |

## DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Stanley | M | West Branch Buffalo Creek | - | - | Controlled discharge | - | - |
| Aurora | M | Buffalo Creek | - | 0.026 | Controlled discharge | - | - |
| Coggon | M | Buffalo Creek | $BOD_5$ | 0.044 | 30 mg/1 | Step 3 + 15 mo. | - |
| Prairieburg | M | Buffalo Creek | - | 0.029 | Controlled discharge | - | - |
| Alpha Crushed Stone, Inc. (Plower Quarry, Linn County) | I | Buffalo Creek | - | - | - | - | Quarry water |
| Wendy Oaks Motel, Linn Co. | S | Wapsipinicon River | - | - | - | - | Lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Anamosa | M | Wapsipinicon River | $BOD_5$ | 0.534 | 30 mg/1 | Step 3 + 15 mo. | - |
| Fairview Terrace Mobile Park, Anamosa | S | Wapsipinicon River | - | - | - | - | Unknown |
| Fawn Creek Mobile Home Ct., Anamosa | S | Wapsipinicon River | - | - | - | - | Activated sludge with polishing lagoon |
| Iowa Electric Light & Power, Anamosa | I | Wapsipinicon River | - | 0.216 D | - | - | Diesel engine cooling water |
| Morley | M | Walnut Creek | - | - | - | - | No treatment |
| Mechanicsville | M | Pioneer Creek | $BOD_5$ | 0.112 | 30 mg/1 | Step 3 + 15 mo. | - |
| RLDS Church Camp, Mechanicsville | S | Pioneer Creek | - | - | - | - | Lagoon |
| Olin | M | Walnut Creek | - | 0.089 | Controlled discharge | - | - |
| Alpha Crushed Stone, Inc., (Olin Quarry) | I | Walnut Creek | - | 0.500 D | - | - | Dewatering pit |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Clarence | M | Mill Creek | $BOD_5$ | 0.070 | 30 mg/1 | Step 3 + 15 mo. | - |
| Oxford Junction | M | Wapsipinicon River | - | 0.078 E | Controlled discharge | - | - |
| Toronto | M | Wapsipinicon River | - | - | - | - | No treatment |
| Lost Nation | M | Drainage Ditch #11 | - | 0.062 E | Controlled discharge | - | - |
| Lowden | M | Yankee Run Creek | $BOD_5$<br>$NH_3$ | 0.018 | 30 mg/1<br>15 mg/1 | - | No needs |
| Frank's Texaco, Lowden | I | Yankee Run Creek | - | - | - | - | To city STP |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Welding Quarries Inc., (Lowden Quarry) | I | Yankee Run Creek | - | - | - | - | Quarry dewatering |
| Wheatland | M | Yankee Run Creek | $BOD_5$ | 0.066 | 30 mg/1 | Step 3 + 15 mo. | - |
| Calamus | M | Calamus Creek | - | 0.020 | Controlled discharge | - | - |
| New Liberty | M | Walnut Creek | - | - | - | - | No treatment |
| Dixon | M | Walnut Creek | - | 0.032 E | Controlled discharge | - | No needs |
| Camp Conestoga, (Girl Scout Camp) | S | Walnut Creek | - | 0.002 D | - | - | Lagoon |
| Plain View | M | Mud Creek | - | - | - | - | No treatment |
| Eldridge STP | M | Hickory Creek | - | 0.542 E | Controlled discharge | Step 3 + 15 mo. | - |
| Eldridge WTP | S | Hickory Creek | - | - | - | - | To city STP |
| County Estates Mobile Home Community, Eldridge | S | Hickory Creek | - | - | - | - | Lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Maysville | M | Hickory Creek | - | 0.019 | Controlled discharge | - | - |
| Donahue | M | East Branch Mud Creek | $BOD_5$ | 0.018 | 30 mg/1 | Step 3 + 15 mo. | - |
| Long Grove | M | Mason Creek | - | 0.030 | Controlled discharge | Step 3 + 15 mo. | - |
| Grand Mound STP | M | Barber Creek | - | 0.042 | Controlled discharge | Step 3 + 15 mo. | - |
| Grand Mound WTP | S | Barber Creek | - | - | - | - | To city STP |
| Welton | M | Silver Creek | - | - | - | - | No treatment |
| DeWitt | M | Dry Run | $BOD_5$ | 0.466 | 30 mg/1 | Step 3 + 15 mo. | - |
| Park View Sanitary Dist. | S | Glynns Creek | - | 0.053 D | - | - | 2 cell lagoon |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| McCausland | M | Wapsipinicon River | - | 0.062 E | Controlled discharge | Step 3 + 15 mo. | - |
| Hidden Valley Mobile Home Park | S | Lost Creek | - | 0.024 D | - | - | Aerated lagoon |
| Princeton | M | Mississippi | - | 0.072 E | Controlled discharge | - | - |
| LeClaire | M | Mississippi | $BOD_5$ | 0.454 E | 30 mg/1 | 10/1/78 | - |
| LeClaire Quarries | I | Mississippi | - | 0.210 D | - | - | Settling ponds |
| Panorama Park | M | Mississippi | - | 0.025 | Controlled discharge | - | - |
| Bettendorf | M | Mississippi | - | - | - | - | To Davenport STP |
| Luney Company, Pleasant Valley | I | Mississippi | - | - | - | - | Process water - 0.032 mgd; septic tank receives 0.003 mgd sanitary wastes |
| Valley Trailer Court, Bettendorf | S | Crow Creek | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Caterpillar Tractor Co., Bettendorf | I | Crow Creek | - | - | - | - | Discharge to city STP |
| Coach Estates Mobile Home Park, Bettendorf | S | Crow Creek | - | - | - | - | Extended aeration |
| Pleasant Valley High School, Pleasant Valley | S | Crow Creek | - | - | - | - | Activated sludge with polishing pond |
| Iowa Highway Commission Recreation Area, Davenport | S | Crow Creek | - | 0.003 D | - | - | Lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| American Oil Co., Bettendorf | I | Mississippi | - | - | - | - | No treatment |
| Texaco, Inc., Bettendorf | I | Mississippi | - | - | - | - | Stormwater |
| Iowa-Illinois Gas & Elec., Riverdale 21 discharges | I | Mississippi | - | 001 = 0.003<br>002 = 0.001<br>003 = 0.004<br>004 = 0.640<br>005 = 0.001<br>006 = N/A<br>007 = 0.068<br>008 = 0.033<br>009 = 1.44<br>010 = 1.44<br>011 = 1.44<br>012 = 0.194<br>013 = 95 | - | - | 001 = Boiler blowdown and cooling water. 002 = Boiler blowdown . 003 = Evaporator blowdown. 004 = Ash lagoon discharge. 005 = Boiler blowdown. 006 = Intake strainer backwash water. 007 = Nos. 5 & 6 sump discharge. 008 = Nos. 5A & 6B sump discharge. 009 = Boiler cooling water. 010 = yard drainage. 011 = Boiler cooling water. 012 = Ash room sump discharge. 013 = Condensor cooling water from #5 turbine. |

# DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Iowa-Illinois Gas & Elec., Riverdale 21 discharges (Continued) | I | Mississippi | - | 014 = 11.5<br>015 = 59<br>016 = 0.004<br>017 = 0.072<br>018 = 127<br>019 = 0.011<br>020 = 0.001<br>021 = 0.014 | - | - | 014 = Condensor cooling water from #3 turbine. 015 = Condensor cooling water from #4 turbine. 016 = Coal filter backwash water 017 = Overflow from ash hopper on #9 Boiler. 018 = Cooling water from turbine. 019 = Demineralizer backwash water. 020 = Zeolite softener backwash water. 021 = Boiler room drain. |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Aluminum Co. of America, Riverdale 6 discharges | I | Mississippi | - | 001 = 1.77<br>002 = 1.14<br>003 = 5.86<br>004 = 2.08<br>005 = 0.142<br>006 = 14.1 | - | - | Cooling water |
| Davenport Water Co., 2 discharges | S | Mississippi | - | 001 = 0.45<br>002 = 0.11 | - | - | 001 = filter backwash; 002 = sludge holding basin |
| John Deere & Co., Davenport | I | Duck Creek | - | 0.250 D | - | - | Cooling water lagoon |
| Hawkeye Land Ltd., Bettendorf | I | Duck Creek | - | 0.011 D | - | - | 2 cell lagoon |
| Lakewood Mobile Home Park, Davenport | S | Duck Creek | - | 0.033 D | - | - | Aerated lagoon with polishing pond |
| Safari Campground, Davenport | S | Silver Creek | - | - | - | - | Lagoon |
| Davenport Ridgeview Dr. (North Div.) | I | Goose Creek | - | 0.600 D | - | - | - |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Davenport | M | Mississippi | $BOD_5$<br>$NH_3$ | 17.116 | 30 mg/1<br>15 mg/1 | - | - |
| Kelsey Hayes Co., Davenport | I | Mississippi | - | 0.023 D | - | - | Cooling water |
| Mathias Mobile Home Park Davenport | S | Mississippi | - | 0.005 D | - | - | Aerated Lagoon |
| Trailer Village, Davenport | S | Mississippi | - | - | - | - | To city STP |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Chicago, Milwaukee, St. Paul Pacific RR, Davenport | I | Mississippi | - | 0.022 D | - | - | Septic tanks |
| Black Hawk Jr. High School, Davenport | S | Mississippi | - | - | - | - | 2 cell lagoon |
| Pleasant View Elementary School Davenport | S | Mississippi | - | - | - | - | Imhoff tank |
| American Oil Co., Davenport | I | Mississippi | - | - | - | - | Holding pond for storm runoff |
| Commonwealth Edison Co., Davenport | I | Mississippi | - | 1440 | - | - | Cooling water discharged through diffuser pipes |
| Occidental Chemical Co., Davenport | I | Mississippi | - | - | - | - | Cooling water |
| U.S. Lock & Dam #14, Davenport | S | Mississippi | - | - | - | - | No treatment |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| KOA Campground, Davenport | S | Cedar River | - | 0.008 D | - | - | Lagoon |
| Scott County Swimming Pool, Davenport | S | Mississippi | - | - | - | - | Lagoon |
| Executive Mobile Home Ct., Davenport | S | Mississippi | - | - | - | - | No treatment |
| Lakeside Manor Mobile Home, Davenport | S | Mississippi | - | - | - | - | 3 cell lagoon |
| Iowa Highway Commission Rest Area, Davenport | S | Mississippi | - | 0.009 D | - | - | Lagoon |

## DISCHARGE INVENTORY

### BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Sun Oil Co. Walcott | I | Mississippi | - | - | - | - | Lagoon |
| Riverview Manor Nursing Home, Pleasant Valley | S | Mississippi | - | 0.007 D | - | - | 2 cell lagoon |
| Royal Neighbors Home for the Aged, Davenport | S | Mississippi | - | - | - | - | To Davenport STP |
| MacMillan Oil Co., Davenport | I | Mississippi | - | - | - | - | Enclosed dike |
| Nursing Care Ltd., Davenport | S | Mississippi | - | 0.010 D | - | - | 2 cell lagoon |
| Black Hawk Foundry & Machine, Davenport | I | Black Hawk Creek | - | - | - | - | Cooling water |
| Mason Company, Davenport | I | Black Hawk Creek | - | - | - | - | No discharge |
| Scott County, I-280 Lake Park, Davenport | S | Black Hawk Creek | - | - | - | - | Activated sludge & polishing lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Buffalo | M | Mississippi | $BOD_5$ | 0.137 | 30 mg/1 | 9/30/78 | - |
| Blue Grass | M | Unnamed Tributary | - | 0.097 | Controlled discharge | Step 3 + 15 mo. | - |
| Linwood Stone Products, Buffalo | I | Thompson Creek | - | 001 = 0.960<br>002 = 0.480<br>003 = 0.020 | - | - | 001 = lime discharge. 002 = surface quarry water.<br>003 = quarry water |
| Martin Marietta Cement, Buffalo | I | Mississippi | - | - | - | - | No treatment |
| Dewey Cement Co., Buffalo | I | Mississippi | - | - | - | - | Septic tanks |

## DISCHARGE INVENTORY

## BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Nickerson Farms, Stockton | S | Unnamed Tributary | - | - | - | - | Lagoon |
| Muscatine | M | Mississippi | $BOD_5$<br>$NH_3$ | 5.76 | 30 mg/1<br>15 mg/1 | - | - |
| Bandag, Inc. Muscatine | I | Mississippi | - | 002 = 0.511<br>004 = 0.040<br>005 = 0.0005<br>006 = 0.014<br>007 = 0.008<br>008 = 0.001 | - | - | 002 = Cooling water<br>004 = Cooling water<br>005 = Cooling water<br>006 = Sanitary wastes<br>007 = Sanitary wastes<br>008 = Cooling water |
| Grain Processing Corp., Muscatine 5 discharges | I | Mississippi | $BOD_5$ | 25.2 | 14.32 mg/1 | 10/1/76 | Treatment provided by city STP as well as direct discharge |
| Heinz, USA, Muscatine | I | Mud Creek | - | 001 = 0.800<br>002 = 0.230 | - | - | 001 = Cooling water to city storm sewer<br>002 = Cooling water to city storm sewer |
| Bethesda Foundation, Muscatine | S | Mud Creek | - | - | - | - | Septic tank |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Clearview Mobile Home Park, Muscatine | S | Mud Creek | - | - | - | - | Lagoon |
| Publickev Industries, Muscatine | I | Mississippi | - | 0.086 D | - | - | Septic tank |
| Eastern Light & Power, Muscatine 6 discharges | I | Mississippi | - | 001 = 0.053<br>002 = N/A<br>003 = 0.004<br>004 = 48<br>005 = 0.053<br>006 = 0.053 | - | - | 001 = From ash lagoon<br>002 = From coal storage area<br>003 = Septic tank<br>004 = Cooling water<br>005 = From ash lagoon<br>006 = From ash lagoon |
| Hon Industries Inc., Muscatine | I | Mississippi | BOD | 0.015 D | 30 mg/1 | - | To septic tank and cooling water to lagoon |

DISCHARGE INVENTORY

BASIN - Northeastern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Monsanto Co, Muscatine | I | Mississippi | BOD<br>COD<br>$NH_3$ | 12.6 | 1,300 lbs.<br>6,900 lbs.<br>1,837 lbs. | - | Activated sludge |
| Thatcher Plastic Packaging, Muscatine | I | Mississippi | BOD<br>COD<br>Phenols | 2.85 | 105 lbs.<br>1,050 lbs.<br>4.4 lbs. | - | Activated sludge |
| North Haven Mobile Park, Muscatine | S | Mississippi | - | - | - | - | Lagoon |
| Ridley, Inc. | I | Mississippi | - | 0.005D | - | - | 3 cell lagoon |
| Fairport Nat'l. Fish Hatchery, Muscatine | I | Mississippi | - | 0.002D | - | - | Extended aeration |
| Muscatine Co. Home | S | Mississippi | - | - | - | - | Imhoff tank |
| Muscatine Power & Water Co. 5 discharges | I | Mississippi | - | 001=64<br>002=0.100<br>003=29<br>004=0.225<br>005=12 | - | - | 001=cooling water.<br>002=Boiler blowdown + demineralizer backwash.<br>003=cooling water.<br>004=Boiler blowdown + demineralizer requirement.<br>005=cooling water. |

D = Design
E = Engineer estimate

M = Municipal
I = Industrial
S = Semipublic

# IOWA-CEDAR

# DISCHARGE INVENTORY

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Crystal Lake | M | West Branch Iowa River | - | - | - | - | No treatment |
| Hancock County Home | S | West Branch Iowa River | - | - | - | - | Septic tank |
| Northern Natural Gas | I | East Branch Iowa River | - | 0.043D | - | - | Compressor cooling water |
| Farmland Industries | I | East Branch Iowa River | - | - | - | - | No treatment |
| Welp & McCarten Reuber Quarry | I | East Branch Iowa River | - | 1.0D | - | - | Quarry dewatering |
| Garner | M | East Branch Iowa River | - | 0.181 | Controlled discharge | - | No needs |
| Klemme | M | East Branch Iowa River | - | 0.045 | Controlled discharge | - | - |
| Goodell | M | East Branch Iowa River | - | - | - | - | No treatment |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Belmond | M | Iowa River | $BOD_5$<br>$NH_3$ | 0.320 | 15 mg/1<br>2 mg/1 | 3/1/80 | - |
| Belmond WTP | S | Iowa River | - | 0.018 | - | - | Lime sludge holding lagoon |
| U.S. Steel Corp. | I | Iowa River | - | 0.250 | - | - | Cooling water |
| Central Soya | I | Iowa River | $BOD_5$<br>$NH_3$ | 0.216D | 22 mg/1<br>2 mg/1 | - | Aerobic lagoon |
| Rowan | M | Iowa River | - | - | - | - | No treatment |
| Galt | M | Wheeler Creek | - | - | - | - | No treatment |
| Weaver Const. Co., Dows Quarry | I | Iowa River | - | 0.720D | - | - | Quarry dewatering |
| Dows | M | Iowa River | $BOD_5$<br>$NH_3$ | 0.067 | 10 mg/1<br>2 mg/1 | Step 3 + 15 Months | - |

DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Popejoy | M | Iowa River | - | - | - | - | No treatment |
| Iowa Limestone Co. | I | Iowa River | - | 0.008 | - | - | No treatment |
| Alden | M | Iowa River | - | 0.060 | Controlled discharge | - | - |
| Weaver Construction Co., Alden Quarry | I | Iowa River | - | 0.002 | - | - | No treatment |
| Soft Water Service | I | Iowa River | - | 0.022 | - | - | Water softner regeneration waste |
| Ralston Purina | I | Iowa River | - | 1.534 | - | - | Cooling water and boiler blowdown |
| Iowa Falls | M | Iowa River | $BOD_5$<br>$NH_3$ | 0.841 | 10 mg/1<br>4 mg/1 | 9/78 | - |
| Iowa Electric Light and Power | I | Iowa River | - | 0.017 | - | - | No treatment |
| Farmland Foods | I | Iowa River | $BOD_5$<br>$NH_3$ | 0.655 | 14 mg/1<br>10 mg/1 | - | No discharge at flows below 9 cfs |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Steamboat Rock | M | Iowa River | $BOD_5$<br>$NH_3$ | 0.023 | 30 mg/1<br>15 mg/1 | 1/1/80 | - |
| Pine Lake State Park | S | Iowa River | - | - | - | - | 2 cell lagoon |
| Eldora | M | Iowa River South Fork | $BOD_5$<br>$NH_3$ | 0.400 | 30 mg/1<br>8 mg/1 | Step 3 + 15 Months | - |
| Williams | M | Iowa River South Fork | - | 0.055 | Controlled discharge | - | - |
| Buckeye | M | Iowa River South Fork | - | - | - | - | No treatment |
| Quakerdale Home | S | Iowa River South Fork | - | 0.01 | - | - | No treatment |
| Owasa | M | Beaver Creek | - | - | - | - | No treatment |
| Harding County Home | S | Beaver Creek | - | - | - | - | Septic tank |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Union | M | Iowa River | - | 0.049 | Controlled discharge | - | - |
| Whitten | M | Dowd Creek | - | - | - | - | No treatment |
| Liscomb | M | Iowa River | - | 0.016 | Controlled discharge | 12/1/78 | - |
| Radcliffe WTP | S | Honey Creek | - | - | - | - | Regeneration wastes from zeolite softener |
| Radcliffe | M | Honey Creek | - | 0.038 | Controlled discharge | - | - |
| Hubbard | M | Honey Creek | - | 0.085 | Controlled discharge | - | - |
| Hubbard School | S | Honey Creek | - | - | - | - | Septic tank |
| New Providence | M | Honey Creek | - | - | - | - | 3 cell lagoon |
| Edrich Addition | S | Honey Creek | - | 0.021 | - | - | Extended aeration |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Zearing WTP | S | Middle Minerva Creek | - | 0.007 | - | - | No treatment |
| Zearing | M | Middle Minerva Creek | - | 0.054 | **Controlled discharge** | - | - |
| St. Anthony | M | Middle Minerva Creek | - | - | - | - | No treatment |
| Clemons | M | Middle Minerva Creek | - | 0.038 | **Controlled discharge** | - | - |
| Albion | M | Chicken Creek | - | 0.038 | **Controlled discharge** | Step 3 +<br>15 Months | - |
| Culligan Soft. Water | I | Iowa River | - | 0.013 | - | - | No treatment |
| Marshalltown | M | Iowa River | $BOD_5$<br>$NH_3$ | 3.756 | **10 mg/1**<br>**2 mg/1** | Step 3 +<br>15 Months | - |
| State Center WTP | S | Linn Creek | - | - | - | - | No treatment |

DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Marshall County Home | S | Linn Creek | - | 0.066D | - | - | Lagoon |
| Fisher Control Co.-Center Street Facility | I | Linn Creek | - | 0.660 | - | - | Cooling water |
| Fisher Control Co.-General Bldg. | I | Linn Creek | - | 0.002 | - | - | Cooling water |
| Kiona Corp. | I | Linn Creek | - | 0.477 | - | - | Cooling and process water |
| Iowa Electric Light and Power Sutherland Station | I | Linn Creek | - | 0.388 | - | - | No treatment |
| Central Iowa Rendering | I | Linn Creek | - | 0.021 | - | - | Cooling water |
| Martin-Marietta Corp.-Marshalltown Sand Plant | I | Linn Creek | - | 0.070 | - | - | No treatment |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| State Center | M | North Timber Creek | $BOD_5$<br>$NH_3$ | 0.162 | 30 mg/1<br>15 mg/1 | - | - |
| Haverhill | M | South Timber Creek | - | - | - | - | No treatment |
| Gilman | M | Brush Creek | - | 0.033 | Controlled discharge | - | - |
| Martin-Marietta Corp., Ferguson Quarry | I | Brush Creek | - | - | - | - | - |
| Furgeson | M | Brush Creek | - | - | - | - | No treatment |
| Lincoln Tervace Estates MHP | S | Timber Creek | - | 0.006D | - | - | Lagoon |
| Cambridge Estates MHP | S | Timber Creek | - | - | - | - | Lagoon |
| LeGrand | M | Iowa River | - | 0.059 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Montour | M | Iowa River | - | 0.021 | Controlled discharge | - | - |
| Garwin | M | Deer Creek | $BOD_5$ | 0.031 | 30 mg/1 | - | No needs |
| Tama County Home | S | Deer Creek | - | - | - | - | Septic tank |
| Toledo | M | Deer Creek | $BOD_5$ | 0.200 | 30 mg/1 | Step 3 + 15 Months | - |
| Packaginc Corp. of America | I | Iowa River | - | 1.0 | - | - | Cooling water |
| Tama | M | Iowa River | $BOD_5$<br>$NH_3$ | 0.280 | 22 mg/1<br>7 mg/1 | - | - |
| Tama Meat Packing Corp. | I | Iowa River | - | 0.770 | Controlled discharge | - | - |
| Chelsea | M | Otter Creek | - | - | - | - | No treatment |
| Clutier | M | Salt Creek | - | 0.027 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

## BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Dysart | M | Salt Creek | $BOD_5$ | 0.110 | 30 mg/1 | Step 3 + 15 Months | - |
| Elberon | M | Salt Creek | - | - | - | - | No treatment |
| Vining | M | Salt Creek | - | - | - | - | No treatment |
| Belle Plaine | M | Iowa River | $BOD_5$ | 0.205 | 30 mg/1 | 9/77 | - |
| Luzerne | M | Iowa River | - | - | - | - | No treatment |
| Hartwick | M | Honey Creek | - | - | - | - | No treatment |
| Malcom Stone Co. | I | Bear Creek | - | 0.384 | - | - | - |
| Lang Farms | I | Little Bear Creek | - | - | - | - | Septic tank |
| Dickey's Prairie Home No. 2 | S | Little Bear Creek | - | 0.003 | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Malcom | M | Little Bear Creek | - | 0.015 | Controlled discharge | - | - |
| Brooklyn WTP | S | Little Bear Creek | - | 0.001 | - | - | No treatment |
| Brooklyn | M | Little Bear Creek | $BOD_5$<br>$NH_3$ | 0.097 | 10 mg/1<br>2 mg/1 | 9/78 | - |
| Victor | M | Bear Creek | $BOD_5$<br>$NH_3$ | 0.083 | 10 mg/1<br>2 mg/1 | Step 3 + 15 Months | - |
| Victor WTP | S | Bear Creek | - | - | - | - | No treatment |
| Ladora | M | Bear Creek | - | 0.032 | Controlled discharge | - | - |
| Amoco | S | Bear Creek | - | 0.001 | - | - | Lagoon |
| Texaco Star Inn | S | Bear Creek | - | - | - | - | - |
| Iowa-Hwy-Commission Rest Area (Northside-Victor) | S | Bear Creek | - | 0.004 | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Sudbury Court Motel | S | Bear Creek | - | - | - | - | - |
| Hallett Const. Co. | I | Iowa River | - | 0.002 | - | - | - |
| Marengo | M | Iowa River | - | 0.224 | Controlled discharge | Step 3 + 15 Months | - |
| Middle Amana S.D. | M | Iowa River | - | - | - | - | No treatment |
| Amana Refrigeration | I | Iowa River | - | - | - | - | Physical-chemical treatment |
| Homestead S.D. | M | Iowa River | - | 0.027 | Controlled discharge | Step 3 + 15 Months | - |
| Amana S.D. | M | Iowa River | - | 0.115 | Controlled discharge | - | No needs |
| Amana Woolen Mills | I | Iowa River | - | 0.055D | - | - | To Amana S.D. |

DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Walford | M | Knapp Creek | - | - | - | - | No treatment |
| Martin-Marietta Corp., Crozier Quarry | I | Knapp Creek | - | 0.531 | - | - | Quarry dewatering |
| Swisher | M | Swisher Creek | $BOD_5$ | 0.039 | 30 mg/1 | - | No needs |
| Data Processing | I | Iowa River | - | - | - | - | Lagoon |
| College Community School District | S | Hoosier Creek | - | 0.023D | - | - | 2 cell lagoon |
| Ely | M | Hoosier Creek | - | 0.028 | Controlled discharge | Step 3 + 15 Months | - |
| Iowa Hwy. Comm. (Swisher) West Side | S | Hoosier Creek | - | - | - | - | Lagoon |
| Iowa Hwy. Comm. (Swisher) East Side | S | Hoosier Creek | - | - | - | - | Lagoon |

# DISCHARGE INVENTORY

## BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Shueyville | M | Hoosier Creek | - | - | - | - | No treatment |
| IO-DIS-E-CA Lutheran Church Camp | S | Iowa River | - | 0.010D | - | - | Lagoon |
| Lake McBride State Park | S | Iowa River | - | - | - | - | 2 cell lagoon |
| Solon | M | Mill Creek | $BOD_5$ | 0.086 | 30 mg/1 | 10/78 | - |
| Cottage Reserve Corp. | I | Iowa River | - | - | - | - | - |
| Lakeview Knolls | S | Turkey Creek | - | 0.040D | - | - | Activated sludge |
| Coral Marina | S | Iowa River | - | 0.001D | - | - | - |
| Timber Trail Estate | S | Sanders Creek | - | - | - | - | Lagoon |

# DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Highlander Supper Club | S | Rapid Creek | - | 0.015D | - | - | 2 cell lagoon |
| Iowa City Westinghouse | M | Rapid Creek | - | 0.005 | Controlled discharge | - | No needs |
| North Liberty | M | Muddy Creek | $BOD_5$<br>$NH_3$ | 0.161 | 30 mg/1<br>10 mg/1 | 2/79 | - |
| Lakewood Hills | S | Muddy Creek | - | - | - | - | Lagoon |
| River Products | I | Iowa River | - | 0.48 | - | - | No treatment |
| Coralville WTP | S | Iowa River | - | 0.050D | - | - | Lagoon |
| Western Hills MHP | S | Iowa River | - | - | - | - | To coralville sanitary sewer |
| Texaco | S | Iowa River | - | - | - | - | No treatment |
| Colony Enterprises | S | Clear Creek | - | 0.012D | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Amana Nordstrom Holiday Inn | S | Clear Creek | - | 0.04 | - | - | 2 cell lagoon |
| Skelley Station | S | Clear Creek | - | 0.0003D | - | - | Lagoon |
| Nickerson Farms | S | Clear Creek | - | - | - | - | Lagoon |
| Safari Inn Campground | S | Clear Creek | - | - | - | - | Lagoon |
| Mobil Oil | S | Clear Creek | - | - | - | - | Lagoon |
| Buck Hummer Trucking | I | Clear Creek | - | - | - | - | No treatment |
| Oxford | M | Clear Creek | $BOD_5$ | 0.044 | 30 mg/1 | - | - |
| Parkview MHP | S | Clear Creek | - | - | - | - | Lagoon |
| Iowa Highway Comm. I-80 (Tiffin) South Side | S | Clear Creek | - | 0.003D | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Iowa Highway Comm. I-80 (Tiffin) North Side | S | Clear Creek | - | 0.003D | - | - | Lagoon |
| Texaco-Tiffin | S | Clear Creek | - | - | - | - | Lagoon |
| Tiffin | M | Clear Creek | $BOD_5$ | 0.029 | 30 mg/1 | - | - |
| Allied Mills | I | Clear Creek | - | 0.005D | - | - | Cooling and boiler blowdown water |
| Martin-Marietta Corp., Klein Quarry | I | Clear Creek | - | 0.223 | - | - | Quarry dewatering |
| Ramada Inn | S | Clear Creek | - | 0.015 | - | - | - |
| Holiday Inn | S | Clear Creek | - | 0.025 | - | - | Activated sludge |
| Johnson County Home | S | Clear Creek | - | 0.011 | - | - | No treatment |
| Iowa City WTP | S | Iowa River | - | - | - | - | No treatment |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| University of Iowa Physical Plant | S | Iowa River | - | 0.037 | - | - | No treatment |
| Culligan Water | I | Ralston Creek | - | 0.020D | - | - | No treatment |
| Iowa City Main Plant | M | Iowa River | $BOD_5$<br>$NH_3$ | 6.276 | 27 mg/1<br>7 mg/1 | 7/79 | - |
| Coralville | M | Iowa River | $BOD_5$<br>$NH_3$ | 1.074 | 30 mg/1<br>10 mg/1 | - | - |
| University Heights | M | Iowa River | - | - | - | - | To Iowa City Main Plant |
| Inidan Lookout MHP | S | Iowa River | - | - | - | - | 2 cell lagoon |
| Far Horizons | S | Snyder Creek | - | - | - | - | Lagoon |
| Sunrise Village MHP | S | Snyder Creek | - | - | - | - | Lagoon |
| Proctor & Gamble | I | Snyder Creek | - | - | - | - | No treatment |

# DISCHARGE INVENTORY

## BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Starlight MHP | S | Snyder Creek | - | - | - | - | - |
| Hills | M | Iowa River | $BOD_5$ | 0.055 | 30 mg/1 | Step 3 +<br>15 Months | - |
| Conoco Station | S | Old Mans Creek | - | 0.005 | - | - | Lagoon |
| Iowa County Home | S | Old Mans Creek | - | - | - | - | Septic tank |
| Land Mark Phillips 66 | S | Old Mans Creek | - | - | - | - | Septic tank |
| Middle America | S | Old Mans Creek | - | 0.001 | - | - | Lagoon |
| Amoco Oil Co. | S | Old Mans Creek | - | 0.001 | - | - | Septic tank |
| Williamsburg | M | Old Mans Creek | $BOD_5$<br>$NH_3$ | 0.181 | 10 mg/1<br>2 mg/1 | Step 3 +<br>12 Months | - |
| Williamsburg WTP | S | Old Mans Creek | - | - | - | - | Lagoon |
| Lone Tree-North Lagoon | M | Iowa River | - | 0.065 | Controlled discharge | - | No needs |

# DISCHARGE INVENTORY

## BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Lone Tree-South Lagoon | M | Iowa River | - | 0.018 | Controlled discharge | - | No needs |
| Lone Tree WTP | S | Iowa River | - | 0.013D | - | - | No treatment |
| Brannian Service Station and Restaurant | S | North English River | - | 0.007D | - | - | Lagoon |
| Guernsey | M | North English River | - | - | - | - | No treatment |
| Deep River | M | Deep River | - | - | - | - | No treatment |
| Iowa Hwy. Comm. (Victor) South Side | S | North English River | - | 0.004D | - | - | Lagoon |
| Millersburg | M | Middle English River | - | - | - | - | No treatment |
| North English WTP | S | Middle English River | - | - | - | - | No treatment |

DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| North English | M | Middle English River | $BOD_5$<br>$NH_3$ | 0.132 | 10 mg/1<br>2 mg/1 | 2/80 | - |
| Parnell | M | Middle English River | - | - | - | - | No treatment |
| Gibson | M | South English River | - | - | - | - | No treatment |
| Kaser Const. Co. Keswick Quarry | I | South English River | - | 0.110 | - | - | Settling pond |
| Keswick | M | South English River | - | - | - | - | No treatment |
| South English | M | South English River | - | - | - | - | No treatment |
| Kinross | M | Smith Creek | - | - | - | - | No treatment |
| Wellman WTP | S | Smith Creek | - | - | - | - | No treatment |
| Wellman | M | Smith Creek | $BOD_5$<br>$NH_3$ | 0.107 | 10 mg/1<br>2 mg/1 | Step 3 + 15 Months | - |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Twin County Dairy | I | Ramsey Creek | - | 0.015 | - | - | Lagoon |
| Green Acres MHP | S | English River | - | 0.015D | - | - | Lagoon |
| Kalona | M | English River | - | 0.631 | Controlled discharge | - | No needs |
| Riverside | M | English River | - | 0.045 | Controlled discharge | 11/78 | - |
| Conesville | M | Honey Creek | - | 0.043 | Controlled discharge | - | - |
| Natural Gas Pipeline Co., Columbus City | I | Iowa River | - | 0.150 | - | - | No treatment |
| Cotter | M | Iowa River | - | - | - | - | No treatment |
| Rath Packing Co. | I | Iowa River | - | 0.525 | - | - | Lagoons |
| Columbus Jct. | M | Iowa River | - | 0.120 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Carpenter | M | Deer Creek | - | - | - | - | No treatment |
| St. Ansgar | M | Cedar River | - | 0.090 | Controlled discharge | 9/1/78 | - |
| Mitchell | M | Cedar River | - | - | - | - | No treatment |
| Osage | M | Sugar Creek | $BOD_5$<br>$NH_3$ | 0.269 | 30 mg/1<br>15 mg/1 | - | - |
| Kark Rendering | I | Cedar River | - | 0.150 | - | - | Closed |
| Orchard | M | Spring Creek | $BOD_5$<br>$NH_3$ | 0.11 | 30 mg/1<br>15 mg/1 | - | - |
| Grafton | M | Rock Creek | - | - | Controlled discharge | - | No needs |
| Floyd | M | Cedar River | - | 0.060 | Controlled discharge | - | - |
| John Haas Housing Dev. | S | Cedar River | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Charles City WTP | S | Cedar River | - | 0.030D | - | - | Thickener |
| Salisbury Lab. | I | Cedar River | - | 0.20 | - | - | Cooling water |
| Charles City | M | Cedar River | $BOD_5$<br>$NH_3$ | 1.882 | 30 mg/1<br>10 mg/1 | 4/79 | - |
| Farmers Co-op Creamery | I | Cedar River | - | 0.015D | - | - | Cooling and process water |
| Nashua | M | Cedar River | $BOD_5$ | 0.135 | 30 mg/1 | 1/79 | - |
| Stacyville | M | Little Cedar River | $BOD_5$<br>$NH_3$ | 0.025 | 30 mg/1<br>15 mg/1 | Step 3 + 15 Months | - |
| Colwell | M | Beaver Creek | - | - | - | - | No treatment |
| Bassett | M | Beaver Creek | - | - | - | - | No treatment |
| Martin-Marietta Corp.-Boice Quarry | I | Little Cedar | - | 0.010D | - | - | Quarry dewatering |

## DISCHARGE INVENTORY

### BASIN - Iowa-Cedar

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Martin-Marietta Corp.-Boever Pit | I | Little Cedar River | - | 0.050 | - | - | Quarry dewatering |
| Martin-Marietta Corp.-Ernivine Quarry | I | Cedar River | - | 0.050 | - | - | No treatment |
| Plainfield | M | Cedar River | - | 0.010 | Controlled discharge | - | - |
| Carnation Co. | I | Cedar River | - | 0.55 | - | - | Cooling water |
| Waverly | M | Cedar River | $BOD_5$<br>$NH_3$ | 0.639 | 30 mg/1<br>15 mg/1 | 5/79 | - |
| Highway No.3 MHP | S | Cedar River | - | - | - | - | Lagoon |
| Denver | M | Quarter Section Run | - | 0.062 | Controlled discharge | Step 3 + 15 Months | - |
| Janesville | M | Cedar River | $BOD_5$ | 0.030 | 30 mg/1 | 2/79 | - |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Clear Lake S.D. | M | Beaverdam Creek | $BOD_5$<br>$NH_3$ | 1.696 | 10 mg/1<br>2 mg/1 | 1-80 | - |
| Swaledale | M | Beaverdam Creek | - | - | - | - | No Treatment |
| Welp & McCarton Inc., Swaledale Quarry | I | Beaverdam Creek | - | 2.5 | - | - | Quarry Dewatering |
| Rockwell | M | Beaverdam Creek | $BOD_5$<br>$NH_3$ | 0.085 | 30 mg/1<br>2 mg/1 | Step 3 & 21 Month | - |
| Thornton | M | Bailey Creek | - | 0.037 | Controlled Discharge | - | - |
| Merservey | M | Bailey Creek | - | - | - | - | No Treatment |
| Sheffield | M | Bailey Creek | - | 0.181 | Controlled Discharge | - | - |
| Dumont | M | West Fork Cedar River | - | 0.304 | Controlled Discharge | Step 3 & 15 Month | - |
| Alexander | M | Buffalo Creek | - | - | - | - | No Treatment |
| Terrace Hill S.D. | S | Otter Creek | - | - | - | - | No Treatment |
| Latimer WTP | S | Spring Creek | - | 0.008 D | - | - | No Treatment |
| Latimer | M | Spring Creek | - | - | - | - | To Coulter STP |
| Beed Lake State Park | S | Spring Creek | - | 0.063 | - | - | Lagoon |

## DISCHARGE INVENTORY

## BASIN - IOWA-CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Hansell | M | Otter Creek | - | - | - | - | No Treatment |
| Hampton | M | Squaw Creek | $BOD_5$<br>$NH_3$ | 0.585 | 30 mg/1<br>5 mg/1 | Step 3 & 15 Month | - |
| Aredale | M | Boylan Creek | - | - | - | - | No Treatment |
| Bristow | M | Boylan Creek | - | - | - | - | No Treatment |
| Coulter | M | Maynes Creek | - | - | Controlled Discharge | - | - |
| Weaver Const. Co. - Hibness Quarry | I | Maynes Creek | - | 2.4 | - | - | Quarry Dewatering |
| Geneva | M | Maynes Creek | - | - | - | - | No Treatment |
| Hallett Const. Co. | I | Maynes Creek | - | 1.5 | - | - | Aggregate Washing |
| Greene Limestone Co. - Burns Quarry | I | Maynes Creek | - | 0.75 | - | - | Quarry Dewatering |
| Allison | M | West Fork Cedar River | - | 0.099 | Controlled Discharge | - | - |
| Martin - Marietta Corp. - Yokom Quarry | I | West Fork Cedar River | - | 1.03 D | - | - | Quarry Dewatering |

DISCHARGE INVENTORY

BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Northwood | M | Shell Rock River | $BOD_5$ | 0.161 | 30 mg/1 | 11-78 | - |
| Welp & McCarter, Inc., - Kuemen Quarry | I | Shell Rock River | - | 1.5 | - | - | Quarry Dewatering |
| Martin - Marietta Corp., Randall Quarry | I | Shell Rock River | - | 0.480 | - | - | Aggregate Washing |
| Kensett | M | Shell Rock River | - | - | - | - | No Treatment |
| Manly | M | Rose Creek | - | 0.129 | Controlled Discharge | - | - |
| Chicago Rock Island & Pacific RR | I | Rose Creek | - | 0.189 D | - | - | Diesel Washing |
| Plymouth | M | Rose Creek | - | - | - | - | 2 Cell Lagoon |
| Rockfalls | M | Shell Rock River | - | - | - | - | No Treatment |
| Nora Springs | M | Shell Rock River | $BOD_5$ | 0.116 | 30 mg/1 | Step 3 & 15 Month | - |
| Rockford | M | Shell Rock River | - | 0.090 | Controlled Discharge | - | - |

DISCHARGE INVENTORY

BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Searville | M | Drainage Ditch #18 | - | - | - | - | No Treatment |
| Thompson | M | Dike Run Creek | - | - | - | - | No Treatment |
| Winnebago County Home | S | Winnebago River | - | 0.002 D | - | - | Septic Tank |
| Leland | M | Winnebago River | - | - | - | - | No Treatment |
| Forest City WTP | S | Winnebago River | - | - | - | - | No Treatment |
| Forest City (E) | M | Winnebago River | $BOD_5$<br>$NH_3$ | 0.337 | 10 mg/1<br>2 mg/1 | 7-79 | - |
| Forest City (SW) | M | Winnebago River | - | 0.132 | - | 7-79 | To Forest City (E) |
| Country Side Court | S | Winnebago River | - | - | - | - | Septic Tanks |
| Pilot Knob State Park | S | Winnebago River | - | - | - | - | Lagoon |
| Lake Mills | M | Beaver Creek | $BOD_5$<br>$NH_3$ | 0.231 | 10 mg/1<br>3 mg/1 | Step 3 & 15 Month | - |
| Walker Mfg. | I | Beaver Creek | - | 0.023 | - | - | To Lake Mills STP |
| Fertile | M | Winnebago River | - | - | - | - | No Treatment |

DISCHARGE INVENTORY

BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Joice | M | Winan's Creek | - | - | - | - | No Treatment |
| Hanlontown | M | Winan's Creek | - | - | - | - | No Treatment |
| Welp & McCarten, Inc., - Stricker Quarry | I | Winnebago River | - | 6.0 | - | - | Quarry Dewatering |
| P & M Stone Co., Wepking Quarry | I | Winnebago River | - | 0.050 D | - | - | Quarry Dewatering |
| Weaver Ready Mix, Quimby Quarry | I | Winnebago River | - | - | - | - | Quarry Dewatering |
| Lehigh Portland Cement Company & Discharges | I | Winnebago River | - | 001 = 15.4<br>002 = 0.97<br>003 = 0.97<br>004 = 0.97<br>005 = 0.14<br>006 = 2.16<br>007 = 0.144<br>008 = 0.072 | - | - | 001 = Steam Condenser<br>002 = Bearing Cooling Water<br>003 = Bearing Cooling Water<br>004 = Bearing Cooling Water<br>005 = Surface Water<br>006 = Quarry Dewatering<br>007 = Quarry Dewatering<br>008 = Quarry Dewatering |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Northwestern States Portland Cement Co., 6 Discharges | I | Winnebago River | - | 001 = 0.6<br>002 = 1.0<br>003 = 0.208<br>004 = 0.137<br>005 = 1.75<br>006 = 0.275 | - | - | 001 = Plant Cooling<br>002 = Quarry Dewatering<br>003 = Quarry Dewatering<br>004 = Quarry Dewatering<br>005 = Quarry Dewatering<br>006 = Excess Water From Deepwell |
| Weaver Construction Co.-Mason City Sand Plant | I | Winnebago River | - | 0.070 | - | - | No Treatment |
| Armour & Company | I | Winnebago River | - | 0.640 | - | - | To Municipal STP |
| Ventura | M | Willow Creek | - | - | - | - | To Clear Lake S.D. |
| Iowa Highway Commission I-35 (Mason City) West Side | S | Willow Creek | - | 0.002 D | - | - | 2 Cell Lagoon |
| Iowa Highway Commission I-35 (Mason City) East Side | S | Willow Creek | - | - | - | - | - |
| Allied Mills | I | Willow Creek | - | 001 = 0.022<br>002 = 0.004 | - | - | 001 = Sanitary Wastes<br>002 = Process Wastes |

# DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Libby Owens Ford | I | Willow Creek | - | 0.058 | - | - | Cooling Water |
| Soft Water Service | I | Willow Creek | - | 0.056 D | - | - | Backwash From Regeration of Water Softeners |
| Interstate Power Co. | I | Willow Creek | - | 13.8 | - | - | Cooling Water |
| Chicago, Milwaukee, St. Paul, & Pacific RR | I | Willow Creek | - | 0.001 D | - | - | Oil Separator and Skimmer |
| Mason City | M | Winnebago River | $BOD_5$<br>$NH_3$ | 4.92 | 10 mg/1<br>3 mg/1 | - | No Needs |
| Hebel Fertilizer & Chemical Co. | I | Winnebago River | - | - | - | - | No Discharge |
| Martin-Marietta Corp. - Portland Quarry | I | Winnebago River | - | 0.710 | - | - | Quarry Dewatering |
| Greene Limestone Co. - Portland Quarry | I | Winnebago River | - | 0.90 | - | - | Quarry Dewatering |
| Marble Rock | M | Shell Rock River | - | 0.046 | Controlled Discharge | - | - |
| Greene | M | Shell Rock River | $BOD_5$<br>$NH_3$ | 0.136 | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Greene Rendering Co. | I | Shell Rock River | - | 0.030 | - | - | 2 Cell Lagoon |
| Dougherty | M | Coldwater Creek | - | - | - | - | No Treatment |
| Greene Limestone Co. - Lubben Quarry | I | Coldwater Creek | - | 0.900 | - | - | Quarry Dewatering |
| Rudd | M | Flood Creek | - | - | Controlled Discharge | - | No Needs |
| Clarksville | M | Shell Rock River | $BOD_5$ | 0.092 | 30 mg/1 | - | No Needs |
| Shell Rock | M | Shell Rock River | $BOD_5$ | 0.116 | 30 mg/1 | Step 3 & 15 Month | - |
| Ackley Food Processors, Inc. | I | Beaver Creek | - | 0.028 | - | - | Overland Flow Treatment System |
| Ackley | M | Middle Fork of South Beaver Creek | $BOD_5$<br>$NH_3$ | 0.189 | 30 mg/1<br>5 mg/1 | Step 3 & 15 Month | - |
| Aplington WTP | S | Middle Fork of South Beaver Creek | - | - | - | - | No Treatment |
| Aplington | M | Middle Fork of South Beaver Creek | $BOD_5$<br>$NH_3$ | 0.053 | 30 mg/1<br>10 mg/1 | 8-78 | - |

# DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Wellsburg | M | South Fork Beaver | $BOD_5$<br>$NH_3$ | 0.040 | 30 mg/1<br>10 mg/1 | Step 3 & 15 Month | - |
| Parkersburg | M | Beaver Creek | - | 0.160 | Controlled Discharge | - | No Needs |
| Stout | M | Beaver Creek | - | - | - | - | No Treatment |
| New Hartford | M | Beaver Creek | - | 0.069 | Controlled Discharge | Step 3 & 15 Month | - |
| West Hill Housing Development | S | Beaver Creek | - | 0.024 | - | - | Activated Sludge |
| Clay Equipment Company | I | Cedar River | - | - | - | - | Lagoon |
| Cedar Falls Utilities | I | Dry Run Creek | - | 5.4 | - | - | Cooling Water and Boiler Blowdown |
| Viking Pump Div., Houdville, Indiana, 7 Dis-Charges | I | Cedar River | - | 001 = 0.017 D<br>002 = 0.002 D<br>002 = 0.002 D<br>003 = 0.0003D<br>004 = 0.002 D<br>005 = 0.006 D<br>006 = 0.004 D<br>007 = 0.002 D | - | - | 001 = Air Conditioning & Steam Jenny<br>002 = Cooling Water<br>003 = Boiler Blowdown<br>004 = Alloys Foundry Drain<br>005 = Iron Foundry Drain & Cooling Water<br>006 = Cooling Water, Quech Tank<br>007 = Roof Drains, and Cooling Water |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Cedar Falls Main Plant | M | Cedar River | $BOD_5$<br>$NH_3$ | 3.717 | 30 mg/1<br>10 mg/1 | 1-79 | - |
| Cedar Falls Mobile Home Village | S | Cedar River | - | - | - | - | 3 Cell Lagoon |
| UNI Plant Services | S | Cedar River | - | - | - | - | 2 Settling Pits |
| Cedar Falls-Cedar Heights STP | M | Cedar River | $BOD_5$<br>$NH_3$ | 0.050 | 30 mg/1<br>15 mg/1 | 1-79 | - |
| Black Hawk County Home | S | Cedar River | - | - | - | - | - |
| Waterloo Industries | I | Cedar River | - | 0.10 | - | - | Cooling & Rinse Water |
| John Deere Company, 6 Discharges | I | Cedar River | - | 001 = 7.776<br>002 = 23.911<br>003 = 2.46<br>004 = 1.65<br>005 = 0.8<br>006 = 1.22 | - | - | Cooling Water and Foundry Waste Water, Metal Plating Wastes are Treated and Discharged to City STP |
| Pepsi Cola Bottling Co. | I | Cedar River | - | 0.0126 D | - | - | Process Water and Rinse Water |
| Engineered Equipment Company | I | Cedar River | - | 0.0045 | - | - | Lagoon |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Holland | M | Black Hawk Creek | - | 0.026 | Controlled Discharge | - | No Needs |
| Mid Equipment Co. | I | Black Hawk Creek | - | - | - | - | 2 Cell Lagoon |
| Grundy Center WTP | S | Black Hawk Creek | - | 0.012 | - | - | No Treatment |
| Grundy Center | M | Black Hawk Creek | $BOD_5$<br>$NH_3$ | 0.355 | 10 mg/1<br>2 mg/1 | 11-78 | - |
| Morrison | M | Black Hawk Creek | - | - | - | - | No Treatment |
| Dietrick MHP | S | Black Hawk Creek | - | - | - | - | Lagoon |
| Reinbeck | M | Black Hawk Creek | $BOD_5$<br>$NH_3$ | 0.212 | 10 mg/1<br>2 mg/1 | - | No Needs |
| Reinbeck Canning Company | I | Black Hawk Creek | - | - | - | - | No Discharge |
| Dike | M | North Black Hawk Creek | $BOD_5$<br>$NH_3$ | 0.137 | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |
| Northern Natural Gas Company | I | Black Hawk Creek | - | 7.050 | - | - | No Treatment |
| M.V.M.P.A. | I | Black Hawk Creek | - | 0.675 | - | - | Cooling Water |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Hudson | M | Black Hawk Creek | $BOD_5$<br>$NH_3$ | 0.149 | 30 mg/1<br>10 mg/1 | 2-77 | - |
| Deere & Company Engine Plant | I | Black Hawk Creek | - | - | - | - | Extended Aeration |
| C.W. Shirey Co. | I | Cedar River | - | 0.010 | - | - | Truck Wash Water |
| Chamberlain Mfg. Co. | I | Virden Creek | - | 0.3 | - | - | Cooling Water |
| Iowa Public Service Co. | I | Virden Creek | - | 89.302 | - | - | All But 0.13 MGD is Surface Water |
| Construction Machinery Co. | I | Cedar River | - | 0.005 | - | - | Cooling Water |
| Rath Packing Co. | I | Cedar River | - | 001 = 2.6<br>002 = 2.48 | - | - | Cooling Water |
| Waterloo | M | Cedar River | $BOD_5$<br>$NH_3$ | 14.959 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Evansdale | M | Cedar River | $BOD_5$<br>$NH_3$ | 0.470 | 30 mg/1<br>15 mg/1 | - | No Needs |
| Cedar Knoll MHP | S | Cedar River | - | 0.002 D | - | - | Lagoon |
| Elk Run School | S | Elk Run | - | 0.005 D | - | - | Septic Tank |
| Elk Run Heights | M | Elk Run | $BOD_5$<br>$NH_3$ | 0.057 | 30 mg/1<br>5 mg/1 | 12-1-79 | - |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Martin-Marietta Corp. - Morgan Quarry | I | Elk Run | - | 1.128 | - | - | Quarry Dewatering |
| Martin-Marietta Corp. - O'Connell Sand Pit | I | Cedar River | - | 0.500 | - | - | Aggregate Washing |
| Prairie View Acres Mobile Home Village | S | Cedar River | - | - | - | - | Lagoon |
| Welp & McCarten Inc., Pint Quarry | I | Poyner Creek | - | 1.0 | - | - | Quarry Dewatering |
| Raymond | M | Poyner Creek | - | - | - | - | No Treatment |
| Gilbertville | M | Cedar River | $BOD_5$<br>$NH_3$ | 0.200 | 30 mg/1<br>15 mg/1 | - | No Needs |
| Martin-Marietta Corp. - Waterloo Quarry | I | Miller Creek | - | 1.0 | - | - | Quarry Dewatering |
| Welp & McCarter, Inc., Newton Quarry | I | Miller Creek | - | 001 = 3.0 D<br>002 = 4.0 D | - | - | Quarry Dewatering |
| Conrad | M | Wolf Creek | $BOD_5$ | 0.050 | 30 mg/1 | - | - |
| Beaman | M | Wolf Creek | - | - | Controlled Discharge | - | No Needs |

DISCHARGE INVENTORY

BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Gladbrook WTP | S | Wolf Creek | - | 0.002 | - | - | No Treatment |
| Gladbrook | M | Wolf Creek | $BOD_5$<br>$NH_3$ | 0.098 | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |
| Lincoln | M | Four Mile Creek | $BOD_5$<br>$NH_3$ | 0.025 | 30 mg/1<br>15 mg/1 | - | - |
| Traer | M | Wolf Creek | $BOD_5$<br>$NH_3$ | 0.141 | 30 mg/1<br>15 mg/1 | - | No Needs |
| Hickory Hills Home of Tama | S | Wolf Creek | - | - | - | - | Lagoon |
| Hickory Hills Park, Black Hawk CCB | S | Wolf Creek | - | 0.052 | - | - | Lagoon |
| Martin-Marietta Corp. - Smith Quarry | I | Cedar River | - | 0.678 | - | - | Quarry Dewatering |
| B.L. Anderson Co. - Ballheim Quarry | I | Cedar River | - | - | - | - | - |
| LaPorte City WTP | S | Cedar River | - | 0.006 | - | - | No Treatment |
| LaPorte City | M | Cedar River | $BOD_5$<br>$NH_3$ | 0.226 | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |
| Oak Grove MHP | S | Cedar River | - | - | - | - | - |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Jesup | M | Spring Creek | $BOD_5$<br>$NH_3$ | 0.332 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Paul Nieman Const. Co. - Bloom Quarry | I | Spring Creek | - | - | - | - | 3 Cell Lagoon |
| Brandon | M | Lime Creek | $BOD_5$ | 0.024 | 30 mg/1 | - | No Needs |
| B.L. Anderson Co. - Jabens Quarry | I | Pratt Creek | - | - | - | - | Quarry Dewatering |
| Mt. Auburn | M | Pratt Creek | - | 0.020 | Controlled Discharge | Step 3 & 15 Month | - |
| B.L. Anderson Co. - Garrison Quarry | I | Hinckle Creek | - | 0.600 | - | - | Settling Basins |
| Garrison | M | Hinckle Creek | - | 0.028 | Controlled Discharge | - | - |
| Vinton WTP | S | Hinckle Creek | - | - | - | - | No Treatment |
| Vinton | M | Cedar River | $BOD_5$<br>$NH_3$ | 1.172 | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |
| Benton County Home | S | Mud Creek | - | - | - | - | Septic Tank |
| B.L. Anderson Co., Miller Quarry | I | Mud Creek | - | 0.015 | - | - | Quarry Dewatering |

DISCHARGE INVENTORY

BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Urbana | M | Cedar River | - | 0.055 | Controlled Discharge | - | - |
| Cono Christian School | S | Blue Creek | - | - | - | - | Lagoon |
| Walker | M | Blue Creek | - | 0.050 | Controlled Discharge | - | - |
| Center Point | M | Blue Creek | BOD$_5$<br>NH$_3$ | 0.121 | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |
| Iowa Electric Light & Power Arnold Energy Center | I | Cedar River | - | 0.020 D | - | - | Extended Aeration |
| Shellsburg WTP | S | Bear Creek | - | 0.012 D | - | - | - |
| Shellsburg | M | Bear Creek | BOD$_5$<br>NH$_3$ | 0.074 | 30 mg/1<br>15 mg/1 | 9-79 | - |
| B.L. Anderson Co. - Long Quarry | I | Bear Creek | - | 0.005 D | - | - | Quarry Dewatering |
| Newall | M | Little Bear Creek | - | 0.035 | Controlled Discharge | Step 3 & 15 Month | - |
| Newall WTP | S | Little Bear Creek | - | - | - | - | No Treatment |

# DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Rollins Homes Country Manor Phase II | S | Little Bear Creek | - | 0.016 | - | - | 3 Cell Lagoon |
| Atkins | M | Dry Creek | $BOD_5$ | 0.037 | 30 mg/1 | Step 3 & 15 Month | - |
| Palo | M | Dry Creek | $BOD_5$<br>$NH_3$ | 0.043 | 30 mg/1<br>15 mg/1 | 12-78 | - |
| B.L. Anderson Co., Alice Quarry | I | West Otter Creek | - | 0.015 D | - | - | Quarry Dewatering |
| Robins | M | West Otter Creek | - | - | - | - | To Cedar River STP |
| Hiawatha | M | West Otter Creek | - | - | - | - | To Cedar River STP |
| Glen Oaks 1st Addition | S | Cedar River | - | - | - | - | Lagoon |
| Lee Crawford Quarry | I | Cedar River | - | 0.155 | - | - | Quarry Dewatering |
| Cedar Rapids WTP | S | Cedar River | - | 0.370 | - | - | Lagoon |
| Collins Radio Group, "C" Ave. | I | Cedar River | - | 001 = 0.013<br>002 = 0.206<br>003 = 0.036 | - | - | 001 = Cooling & Process Water<br>002 = Cooling & Process Water<br>003 = Cooling & Process Water |

## DISCHARGE INVENTORY

BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Weyerhaeuser, Co. | I | Cedar River | - | - | - | - | Truck Wash |
| Collins Radio Group, 35th St. | I | Cedar River | - | 001 = 0.712<br>002 = 0.600 | - | - | 001 = Cooling & Process Water<br>002 = Cooling & Process Water |
| Iowa Electric Light & Power, 6th St. Station | I | Cedar River | - | 001 = 2.02<br>002 = 106 | - | - | 001 = Ash Ponds<br>002 = Cooling Water |
| Cargill - 6th St. Plant | I | Cedar River | - | 1.014 | - | - | Cooling Water |
| Chicago, Rock Island & Pacific RR | I | Cedar River | - | 0.012 D | - | - | No Treatment |
| King's Concrete | I | Cedar River | - | 0.005 D | - | - | No Treatment |
| Quacker Oats | I | Cedar River | - | 2.265 D | - | - | Cooling Water |
| Cargill - 10th Ave, Plant | I | Cedar River | - | 0.679 | - | - | Cooling Water |
| Penick & Ford | I | Cedar River | - | 2.43 | Operation Closed | - | Cooling & Process Water |
| Wilson-Sinclair | I | Cedar River | - | 001 = 0.1<br>002 = 0.04 | - | - | 001 = Storm<br>002 = Storm & Cooling |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Cargill - 16th St. Plant | I | Cedar River | - | 2.54 | - | - | Cooling & Process Water |
| Cedar Rapids Main Plant | M | Cedar River | $BOD_5$<br>$NH_3$ | 25.535 | 30 mg/1<br>5 mg/1 | 11-78 | - |
| Martin-Marietta Corp. - Sand Plant | I | Cedar River | - | 2.0 D | - | - | Aggregate Washing |
| Keystone | M | Prairie Creek | - | 0.047 | Controlled Discharge | - | - |
| Van Horne | M | Prairie Creek | $BOD_5$<br>$NH_3$ | 0.034 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Blairstown WTP | S | Prairie Creek | - | - | - | - | No Treatment |
| Blairstown | M | Prairie Creek | - | 0.033 | Controlled Discharge | Step 3 & 15 Month | - |
| Norway | M | Prairie Creek | - | 0.027 | Controlled Discharge | - | - |
| Fairfax | M | Prairie Creek | - | 0.064 | Controlled Discharge | Step 3 & 15 Month | - |
| Chicago, North-Western RR, Beverly Station | I | Prairie Creek | - | 0.020 D | - | - | Car Washing |
| Waconia-Sorghum | I | Prairie Creek | - | 1.72 D | - | - | Cooling & Evaporator Water |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| W. R. Grace | I | Prairie Creek | - | - | - | - | No Treatment |
| Cherry Burrell | I | Prairie Creek | $BOD_5$<br>$NH_3$ | 0.122 D | 20 mg/1<br>2 mg/1 | - | No Treatment |
| Texaco, Inc. | I | Prairie Creek | - | - | - | - | No Treatment |
| Hubbard Feeds | I | Prairie Creek | - | - | - | - | Septic Tank |
| St. Regis Paper | I | Prairie Creek | - | 0.001 D | - | - | - |
| Lincoln Way Village | S | Prairie Creek | - | 0.047 | - | - | Lagoon |
| Kirkwood Community College | S | Prairie Creek | - | - | - | - | To Cedar Rapids STP |
| Iowa Electric Light & Power, Prairie Creek Station | I | Prairie Creek | - | 001 = 70.38 D<br>002 = 0.328 D | - | - | 001 = Cooling Water<br>002 = Ash Settling Pond |
| Alburnett | M | Indian Creek | - | 0.042 | Controlled Discharge | - | - |
| Linn County | S | Indian Creek | - | 0.020 D | - | - | Lagoon |
| Lehigh Portland Cement Co. | I | Indian Creek | - | 0.0004 D | - | - | Truck Wash Rack |
| Marion | M | Indian Creek | - | - | - | - | To Cedar Rapids STP |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Culligan Water Conditioning | I | Indian Creek | - | 0.004 D | - | - | No Treatment |
| Kilborn Photo | I | Cedar River | - | 0.007 D | - | - | Compressor Cooling Water |
| Cedar Rapids Indian Creek Plant | M | Cedar River | - | - | - | - | To Main STP |
| Springville | M | Big Creek | $BOD_5$ | 0.175 | 30 mg/1 | Step 3 & 15 Month | - |
| DeWees-Potthoff-Bowser Quarry | I | Big Creek | - | 0.050 D | - | - | Quarry Dewatering |
| Carlton Mobile Home Court | S | Big Creek | - | - | - | - | Lagoon |
| DeWees-Pothoff-Dice Sand Pit | I | Big Creek | - | 0.050 D | - | - | No Treatment |
| Martelle | M | Elbow Creek | - | - | - | - | No Treatment |
| Bertram | M | Elbow Creek | - | - | - | - | No Treatment |
| Martin-Marietta Corp.-Stone Quarry | I | Cedar River | - | 0.090 | - | - | Quarry Dewatering |
| Midwest Name-plate Co. | I | Cedar River | - | - | - | - | Settling Tanks |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Lisbon | M | Spring Creek | $BOD_5$ | 0.131 | 30 mg/1 | - | - |
| Mt. Vernon | M | Spring Creek | $BOD_5$ | 0.370 | 30 mg/1 | 6-78 | - |
| Stanwood | M | Rock Creek | $BOD_5$ | 0.040 | 30 mg/1 | Step 3 & 15 Month | - |
| R.L.D.S. Church Camp | S | Rock Creek | - | - | - | - | Lagoon |
| Cedar County Home | S | Rock Creek | - | - | - | - | - |
| Martin-Marietta Corp. - Peden Quarry | I | Cedar River | - | 2.0 D | - | - | Quarry Dewatering |
| Home Oil Co. | S | Cedar River | - | 0.007 D | - | - | Lagoon |
| Tipton | M | Crooked Creek | $BOD_5$ | 0.322 | 30 mg/1 | 10-79 | - |
| Cedar Lake MHP | S | Crooked Creek | - | 0.004 D | - | - | Lagoon |
| Stuckey Camp Park | S | Crooked Creek | - | - | - | - | - |
| Cedar River Company | S | Crooked Creek | - | - | - | - | 2 Cell Lagoon |
| I-80 Wheel | S | Cedar River | - | - | - | - | Lagoon |
| Wendling Quarries- Atalissa Quarry | I | Cedar River | - | 0.030 D | - | - | Quarry Dewatering |

## DISCHARGE INVENTORY

### BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Wendling Quarries | I | Sugar Creek | - | 0.720 D | - | - | Quarry Dewatering |
| Bennett | M | Sugar Creek | - | 0.031 | Controlled Discharge | Step 3 & 15 Month | - |
| Iowa Highway Commission (Wilton) North Side | S | Sugar Creek | - | 0.001 D | - | - | Lagoon |
| Iowa Highway Commission (Wilton) South Side | S | Sugar Creek | - | 0.001 D | - | - | Lagoon |
| Skelley Oil Company | S | Sugar Creek | - | 0.003 D | - | - | Lagoon |
| Walcott | M | Mud Creek | - | 0.140 | Controlled Discharge | - | No Needs |
| Stockton | M | Mud Creek | - | 0.019 | Controlled Discharge | - | - |
| Durant | M | Mud Creek | $BOD_5$<br>$NH_3$ | 0.201 | 30 mg/l<br>15 mg/l | Step 3 & 15 Month | - |
| Wilton WTP | S | Mud Creek | - | 0.018 D | - | - | Filter Backwash |
| Wilton | M | Mud Creek | $BOD_5$ | 0.295 | 30 mg/l | Step 3 & 15 Month | - |
| Kampgrounds of Iowa | S | Wapsinonoc Creek | - | 0.003 D | - | - | - |

## DISCHARGE INVENTORY

### BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Whittington Addition | S | Wapsinonoc Creek | - | 0.020 | - | - | Lagoon |
| West Liberty | M | Wapsinonoc Creek | $BOD_5$ | 0.345 | 30 mg/1 | - | No Needs |
| West Branch | M | Wapsinonoc Creek | $BOD_5$ | 0.132 | 30 mg/1 | Step 3 & 15 Month | - |
| Stuelke MHP | S | Wapsinonoc Creek | - | - | - | - | - |
| West Liberty WTP | S | Wapsinonoc Creek | - | 0.020 D | - | - | Filter Backwash |
| Atalissa | M | Goshen Ditch | - | - | - | - | No Treatment |
| Nichols | M | Big Slough | - | 0.042 | - | - | 2 Cell Lagoon |
| Fredonia | M | Iowa River | - | - | - | - | No Treatment |
| Ainsworth | M | Long Creek | - | - | - | - | No Treatment |
| River Products | I | Long Creek | - | 0.030 D | - | - | No Treatment |
| Columbus City | M | Long Creek | - | - | - | - | No Treatment |
| Natural Gas Pipeline-Cairo Gas Storage | I | Long Creek | - | 0.096 D | - | - | Groundwater Pumping Test |
| Letts | M | Indian Creek | - | - | Controlled Discharge | - | No Needs |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Grandview | M | Iowa River | - | - | - | - | 3 Cell Lagoon |
| H. J. Hienz | I | Iowa River | - | - | - | - | Lagoon |
| Louisa County Home | S | Iowa River | - | - | - | - | Lagoon |
| Wapello | M | Iowa River | - | 0.187 | Controlled Discharge | Step 3 & 15 Month | - |
| Morning Sun | M | Otter Creek | - | 0.091 | Controlled Discharge | - | - |
| Oakville | M | Iowa River | - | - | - | - | No Treatment |
| Mediapolis | M | Hawkeye Creek | - | 0.120 | Controlled Discharge | - | - |
| Raid Quarries-Nelson Quarry | I | Hawkeye Creek | - | 0.023 D | - | - | Quarry Dewatering |
| Kaser Construction Co. - Mediapolis Quarry | I | Flint Creek | - | 0.370 D | - | - | Quarry Dewatering |
| U.S. Gypsum | I | Flint Creek | - | 0.045 D | - | - | 2 Cell Lagoon |
| Echo Valley MHP | S | Flint Creek | - | - | - | - | Lagoon |
| Des Moines County Home | S | Flint Creek | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

## BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Burlington Northern RR | I | Flint Creek | - | 0.080 D | - | - | Lagoon |
| TRW/IRC Fixed Resistors | I | Flint Creek | - | 0.040 D | - | - | Cooling Water |
| Rutherford-Potato | I | Flint Creek | - | 0.20 D | - | - | Potato Wash Water |
| Green Acres MHP | S | Flint Creek | - | - | - | - | Lagoon |
| Burlington WTP | S | Flint Creek | - | - | - | - | 3 Cell Lagoon |
| J. I. Case | I | Flint Creek | - | 0.120 D | - | - | Settling Pond |
| Texaco, Inc. | S | Mississippi River | - | - | - | - | Storm Water Runoff |
| Midwest Mfg. | I | Mississippi River | - | 0.476 D | - | - | Cooling Water and Process Water Containing Oil and Grease |
| Riley Bros., Inc. | I | Mississippi River | - | - | - | - | - |
| Burlington | M | Mississippi River | $BOD_5$ | 3.240 | 30 mg/1 | 5-1-82 | - |
| American Oil | I | Mississippi River | - | 0.022 D | - | - | No Treatment |

## DISCHARGE INVENTORY

### BASIN - IOWA - CEDAR

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Iowa Southern Utilities | I | Mississippi River | - | 001 = 0.675 D<br>002 = 0.001 D<br>003 = 0.36 D<br>004 = 114.3 D | - | - | Cooling Water |
| Spring Grove MHP | S | Mississippi River | - | - | - | - | - |
| Plantation Village MHP | S | Mississippi River | - | - | - | - | Lagoon |
| West Burlington | M | Spring Creek | $BOD_5$ | 0.451 | 30 mg/1 | 7-78 | - |
| Spring Lake Camp Grounds | S | Spring Creek | - | - | - | - | Lagoon |

D = Design
E = Engineers Estimate
M = Municipal
I = Industrial
S = Semipublic

# SKUNK

# DISCHARGE INVENTORY

# DISCHARGE INVENTORY

## BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Williams | M | Drainage Ditch # 64 | - | 0.053 | Controlled Discharge | - | - |
| Bob Welch Truck Stop | S | Drainage Ditch # 24 | - | - | - | - | 2 Cell Lagoon |
| American Oil Company | S | Drainage Ditch #24 | - | - | - | - | 2 Cell Lagoon |
| Ellsworth WTP | S | South Skunk River | - | 0.051 | - | - | Iron and Manganese Filter Backwash |
| Ellsworth | M | South Skunk River | - | 0.209 | Controlled Discharge | 7-15-78 | - |
| Blairsburg WTP | S | Drainage Ditch | - | - | - | - | Iron Filter Backwash |
| Blairsburg | M | Drainage Ditch | - | 0.033 | Controlled Discharge | - | - |
| Kamrar | M | Drainage Ditch | - | - | Controlled Discharge | - | - |
| Jewell WTP | S | Drainage Ditch | - | - | - | - | - |
| Jewell | M | Drainage Ditch | - | 0.081 | Controlled Discharge | - | - |
| Jewell School | S | Drainage Ditch | - | - | - | - | No Treatment |
| Randall | M | South Skunk River | - | - | - | - | No Treatment |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Story City WTP | S | South Skunk River | - | - | - | - | Iron Filter and Zeolite Backwash |
| Story City | M | South Skunk River | $BOD_5$<br>$NH_3$ | 0.312 | 10 mg/1<br>2 mg/1 | 12-1-78 | - |
| Weaver Construction Company | I | Long Dick Creek | - | 3.4 | - | - | Quarry Dewatering |
| Roland | M | Bear Creek | - | 0.036 | Controlled Discharge | Step 3 & 15 Month | - |
| Iowa Hwy. Commission Rest Area No. 019R | S | Bear Creek | - | 0.003 | - | - | 2 Cell Lagoon |
| Iowa Hwy. Commission Rest Area No. 020R | S | Bear Creek | - | 0.003 | - | - | 2 Cell Lagoon |
| Gilbert | M | Drainage Ditch #170 | - | 0.052 | Controlled Discharge | Step 3 & 15 Month | - |
| Martin Marietta Robertson Quarry | I | South Skunk River | - | 0.050 | - | - | No Treatment |
| Hallett Construction Company | I | South Skunk River | - | 1.80 | - | - | No Treatment |
| City of Ames, Power Plant | I | South Skunk River | - | 0.043 | - | - | Cooling Water |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Sunstrand Hydro-Transmission | I | South Skunk River | - | 0.015 | - | - | Cooling Water |
| Hillsdale MHP | S | South Skunk River | - | - | - | - | 2 Cell Lagoon |
| Hickory Grove MHP | S | South Skunk River | - | 0.001 | - | - | Septic Tank |
| The Homestead Colony | S | South Skunk | - | - | - | - | Lagoon |
| Stanhope WTP | S | Squaw Creek | - | - | - | - | Iron Filter Backwash |
| Stanhope | M | Squaw Creek | - | 0.041 | Controlled Discharge | - | - |
| Ames Laboratory Research Reactor Atomic Energy Commission | I | Onion Creek | - | - | - | - | Cooling Water |
| Kings Terrace MHP | S | Squaw Creek | - | 0.008 | - | - | Extended Aeration With Polishing Pond |
| Crestview Trailer Park | S | Squaw Creek | - | - | - | - | Aerated Lagoon |
| Iowa State University Physical Plant | S | Squaw Creek | - | 0.41 | - | - | Cooling Water |

# DISCHARGE INVENTORY

## BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Glenbrook MHP | S | Worle Creek | - | - | - | - | Lagoon |
| Ames WTP | S | South Skunk | - | - | - | - | No Discharge |
| Ames | M | South Skunk River | $BOD_5$<br>$NH_3$ | 4.85 | 10 mg/1<br>2 mg/1 | Step 3 & 21 Month | - |
| Kelley | M | South Skunk River | - | - | Controlled Discharge | - | - |
| Martin Marietta Cambridge Mine | I | Ballard Creek | - | 0.05 | - | - | - |
| Huxley WTP | S | Ballard Creek | - | 0.0075 | - | - | Iron and Manganese Filter and Zeolite Backwash |
| Huxley | M | Ballard Creek | $BOD_5$<br>$NH_3$ | 0.112 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Cambridge | M | South Skunk River | - | 0.061 | Controlled Discharge | - | - |
| Elkhart | M | South Skunk River | - | 0.013 | Controlled Discharge | Step 3 & 15 Month | - |
| Valeria | M | South Skunk River | - | - | - | - | No Treatment |
| Chelleen Motel | S | South Skunk River | - | - | - | - | 2 Cell Lagoon |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Goodwin's Colfax MHP | S | South Skunk River | - | 0.020 | - | - | Lagoon |
| Colfax | M | South Skunk River | $BOD_5$<br>$NH_3$ | 0.127 | 10 mg/1<br>2 mg/1 | 9-1-79 | - |
| Nevada WTP | S | West Branch Indian Creek | - | 0.480 | - | - | Iron Filter Backwash |
| Nevada | M | West Branch Indian Creek | $BOD_5$<br>$NH_3$ | 0.435 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| McCallsburg WTP | S | East Branch Indian Creek | - | - | - | - | Iron Filter Backwash |
| McCallsburg | M | Drainage Ditch #36 | - | 0.040 D | Controlled Discharge | - | - |
| Colo | M | Dye Creek | - | 0.040 | Controlled Discharge | Step 3 & 15 Month | - |
| Esther Estate MHP | S | Dye Creek | - | - | - | - | Lagoon |
| Maxwell | M | Indian Creek | $BOD_5$<br>$NH_3$ | 0.066 | 10 mg/1<br>2 mg/1 | 3-1-79 | - |
| Collins | M | Wolf Creek | - | 0.024 | Controlled Discharge | - | - |
| Mingo WTP | S | Indian Creek | - | 0.002 | - | - | Iron Filter Backwash |

# DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Mingo | M | Indian Creek | - | 0.025 | Controlled Discharge | - | - |
| Rhodes | M | Clear Creek | - | 0.035 | Controlled Discharge | - | No Needs |
| Nickerson Farms #14 | S | Fullington Creek | - | - | - | - | Lagoon |
| Skelley | S | Fullington Creek | - | - | - | - | Lagoon |
| Baxter | M | Prairie Creek | $BOD_5$<br>$NH_3$ | 0.068 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Edgetown MHP | S | Benjamin Creek | - | - | - | - | Lagoon |
| Maytag Dairy Farms, Inc. | I | Benjamin Creek | - | 0.0044 | - | - | Lagoon |
| Newton N.W. | M | Cherry Creek | $BOD_5$<br>$NH_3$ | 0.173 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Lambs Grove | M | Cherry Creek | $BOD_5$<br>$NH_3$ | 0.010 | 10 mg/1<br>2 mg/1 | 12-1-78 | - |
| Newton S.W. | M | Cherry Creek | $BOD_5$<br>$NH_3$ | 0.263 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Newton W. | M | Cherry Creek | $BOD_5$<br>$NH_3$ | 0.014 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Newton E. | M | Cherry Creek | - | - | - | - | Plant Abandoned |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| GM MHP | S | Cherry Creek | - | - | - | - | Lagoon |
| Maytag Plant No. 1 | I | Cherry Creek | - | 0.2 | - | - | Cooling Water |
| Maytag Plant No. 2 | I | Cherry Creek | - | 0.05 | - | - | Cooling Water |
| River View Release Center | S | Cherry Creek | - | - | - | - | 2 Cell Lagoon |
| Newton S. | M | Sewer Creek | $BOD_5$<br>$NH_3$ | 2.17 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Reasnor | M | South Skunk River | - | 0.024 | Controlled Discharge | - | - |
| Monroe E. | M | Buck Creek | $BOD_5$<br>$NH_3$ | 0.087 | 10 mg/1<br>2 mg/1 | 7-1-79 | - |
| Pella N.W. + N.E. & S.W. | M |  | New Plant to Discharge to Des Moines Basin |  |  |  |  |
| Pella Municipal Power Plant | S | Thunder Creek | - | 0.070 | - | - | Cooling Tower and Boiler Blowdown |
| Jasper County Home | S | Elk Creek | - | - | - | - | Lagoon |
| Kaser Construction Company, Oskaloosa Quarry | I | South Skunk River | - | 0.360 | - | - | - |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| University Park | M | Spring Creek | $BOD_5$<br>$NH_3$ | 0.054 | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |
| Oskaloosa N.E. | M | Spring Creek | $BOD_5$<br>$NH_3$ | 0.980 | 10 mg/1<br>2 mg/1 | 10-1-78 | - |
| Clow Corp. Plant No. 2 | I | Spring Creek | - | 0.013 | - | - | Cooling Water |
| Lake Keomah State Park | S | South Skunk River | - | 0.0284 | - | - | Imhoff Tank-Sand Filter |
| Keomah | M | South Skunk River | - | - | Controlled Discharge | - | No Needs |
| Rose Hill | M | South Skunk River | - | - | - | - | No Treatment |
| Martin Marietta Corporation | I | South Skunk River | - | - | - | - | Quarry Dewatering |
| Hedrick | M | Sugar Creek | - | 0.035 | Controlled Discharge | Step 3 & 15 Month | - |
| Martinsburg | M | South Skunk River | - | - | - | - | No Treatment |
| Ollie | M | South Skunk River | - | - | Controlled Discharge | - | - |
| Kaser Construction Company, Ollie Quarry | I | South Skunk River | - | 0.134 | - | - | - |

## DISCHARGE INVENTORY

BASIN - SKUNK

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Melbourne | M | Unnamed Creek | $BOD_5$<br>$NH_3$ | 0.048 | 30 mg/l<br>2 mg/l | Step 3 & 15 Month | - |
| Laurel | M | Alloway Creek | - | - | Controlled Discharge | - | - |
| Smith-Jones, Inc. | I | North Skunk River | ZN<br>$BOD_5$<br>$NH_3$<br>Chromium | 0.071 | 1 mg/1<br>30 mg/1<br>5 mg/1<br>1 mg/1 | - | - |
| Kellogg WTP | S | North Skunk River | - | - | - | - | No Treatment |
| Kellogg | M | North Skunk River | $BOD_5$<br>$NH_3$ | 0.023 | 10 mg/1<br>3.5 mg/1 | 10-1-78 | - |
| Rock Creek St. Park | S | Rock Creek | - | 0.047 | - | - | Lagoon |
| Rock Creek State Park | S | Rock Creek | - | 0.053 | - | - | Lagoon |
| Kaser Construction Co.,Sully Quarry | I | Slater Creek | - | 0.053 | - | - | - |
| Sully | M | Slater Creek | - | 0.084 | Controlled Discharge | Step 3 & 15 Month | - |
| Sully-Lynnville Community School | S | Slater Creek | - | - | - | - | Sully STP |
| Sully School for Christian Training | S | Slater Creek | - | - | - | - | - |

DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Lynnville | M | Slater Creek | - | 0.010 | Controlled Discharge | - | - |
| Newburg Elementary School | S | Sugar Creek | - | 0.0005 | - | - | Extended Aeration |
| Grinnell WTP | S | Sugar Creek | - | 1.655 | - | - | Zeolite Backwash |
| Grinnell | M | Sugar Creek | $BOD_5$<br>$NH_3$ | 1.838 | 10 mg/1<br>2 mg/1 | 12-1-78 | - |
| Miracle Recreation Equipment Co. | I | Sugar Creek | - | 0.002 | - | - | To Grinnell STP |
| Iowa Hwy. Commission Rest Area No. 007R | S | Sugar Creek | - | 0.003 | - | - | 2 Cell Lagoon |
| Iowa Hwy. Commission Rest Area No. 008 R | S | Sugar Creek | - | 0.003 | - | - | 2 Cell Lagoon |
| Grinnell Mutual Reinsurance Co. | I | Sugar Creek | - | - | - | - | Lagoon |
| American Oil Co. | S | Sugar Creek | - | - | - | - | Septic Tank |
| Searsboro | M | West Creek | - | - | - | - | No Treatment |
| Kaser Construction Co., New Sharon Quarry | I | North Skunk River | - | - | - | - | Quarry Dewatering |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Montezuma | M | Moon Creek | - | 0.097 | Controlled Discharge | Step 3 & 15 Month | - |
| Barnes City | M | Pleasant Creek | - | - | Controlled Discharge | - | - |
| New Sharon | M | Middle Creek | $BOD_5$<br>$NH_3$ | 0.069 | 30 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Martin Marietta Delta Quarry | I | North Skunk River | - | 0.050 | - | - | No Treatment |
| Hayesville | M | North Skunk River | - | - | - | - | No Treatment |
| What Cheer WTP | S | Coal Creek | - | - | - | - | Iron Filter and Zeolite Backwash |
| What Cheer | M | Coal Creek | $BOD_5$<br>$NH_3$ | 0.069 | 30 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Delta | M | Cedar Creek | - | - | Controlled Discharge | - | - |
| Tri-County School | S | Rock Creek | - | - | - | - | Septic Tanks |
| Thornburg | M | Rock Creek | - | - | - | - | No Treatment |
| Sigourney W. | M | Rock Creek | $BOD_5$<br>$NH_3$ | 0.095 | 30 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Sigourney WTP | S | North Skunk River | - | 0.030 | - | - | Iron Filter Backwash |

# DISCHARGE INVENTORY

## BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Sigourney E. | M | Bridge Creek | $BOD_5$<br>$NH_3$ | 0.100 | 30 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Keokuk County Home | S | Bridge Creek | - | 0.004 | - | - | Lagoon |
| Webster | M | German Creek | - | - | - | - | No Treatment |
| South English | M | German Creek | - | - | Controlled Discharge | - | - |
| Natural Gas Line Co. | I | German Creek | - | - | - | - | No Treatment |
| Harper | M | Clear Creek | - | - | Controlled Discharge | - | - |
| Kaser Construction Co., Harper Quarry | I | Clear Creek | - | 0.100 | - | - | No Treatment |
| Keota WTP | S | Dutch Creek | - | - | - | - | Zeolite Backwash |
| Keota | M | Dutch Creek | $BOD_5$ | 0.105 | 30 mg/1 | Step 3 & 15 Month | - |
| The River Products Co., Keota County | I | Dutch Creek | - | 0.05 | - | - | Quarry Dewatering & Rock Washing |
| Richland | M | Skunk River | - | - | Controlled Discharge | - | No Needs |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Lake Darling State Park | S | Skunk River | - | - | - | - | 2-1 Cell Lagoons |
| Brighton | M | Skunk River | $BOD_5$ | 0.043 | 30 mg/1 | Step 3 & 15 Month | = |
| West Chester | M | West Fork Crooked Creek | - | - | Controlled Discharge | - | - |
| Kaser Construction Co., West Chester Quarry | I | West Fork Crooked Creek | - | 0.016 | - | - | No Treatment |
| Washington County Home | S | West Fork Crooked Creek | - | - | - | - | Imhoff Tank - Rock Filter |
| Linn Hollow MHP | S | West Fork Crooked Creek | - | - | - | - | Lagoon |
| Washington | M | West Fork Crooked Creek | $BOD_5$<br>$NH_3$ | 1.058 | 20 mg/1<br>5 mg/1 | 8-1-79 | - |
| Hidden Valley MHP | S | West Fork Crooked Creek | - | - | - | - | Lagoon |
| The River Products Co., Young American Quarry | I | West Fork Crooked Creek | - | 0.320 D | - | - | Sedimentation Lagoon |
| Mt. Union | M | East Fork Crooked Creek | - | - | Controlled Discharge | - | - |
| Winfield WTP | S | East Fork Crooked Creek | - | 0.0045 | - | - | To STP |

## DISCHARGE INVENTORY

### BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Winfield | M | East Fork Crooked Creek | $BOD_5$<br>$NH_3$ | 0.045 | 30 mg/1<br>15 mg/1 | 10-1-78 | - |
| Olds | M | East Fork Crooked Creek | - | - | Controlled Discharge | - | - |
| Crawfordsville | M | East Fork Crooked Creek | - | - | - | - | No Treatment |
| Lake Trio Home-Owner Assn., Inc. | S | Crooked Creek | - | 0.001 | - | - | Aerated Lagoon |
| Cargill | I | Crooked Creek | - | 0.282 | - | - | To Municipal Storm Sewer |
| Coppock | M | Crooked Creek | - | - | - | - | No Treatment |
| Kaser Construction Co., Coppock Quarry | I | Crooked Creek | - | 7.65 | - | - | Quarry Dewatering |
| Wayland | M | Sugar Creek | - | 0.021 | Controlled Discharge | - | - |
| Martin Marietta, Anderson Quarry | I | Walnut Creek | - | 0.140 | - | - | Quarry Dewatering |
| Pleasant Plain | M | Burr Oak Creek | - | - | - | - | No Treatment |
| Lockridge | M | Brush Creek | - | - | Controlled Discharge | - | - |

## DISCHARGE INVENTORY

## BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Rome | M | Skunk River | - | - | - | - | No Treatment |
| Fremont | M | Cedar Creek | - | 0.048 | Controlled Discharge | - | - |
| Agency | M | Buckeye Creek | - | 0.061 | Controlled Discharge | - | - |
| Packwood | M | Coon Creek | - | 0.016 | Controlled Discharge | - | - |
| Batavia | M | Rock Creek | - | - | Controlled Discharge | - | No Needs |
| North American Rockwell Corp. | I | Mitchell Creek | - | 0.080 | - | - | 3 - Cell Lagoon |
| Fairfield WTP | S | Crow Creek | - | 0.050 | - | - | No Treatment |
| Acco Cable Controls | I | Crow Creek | - | 0.12 | - | - | Cooling Water |
| Fairfield | M | Crow Creek | $BOD_5$<br>$NH_3$ | 0.729 | 10 mg/1<br>2 mg/1 | Step 3 & 21 Month | - |
| Dexter Co. | I | Crow Creek | - | 0.025 | - | - | Cooling Water |
| Jefferson County Home | S | Crow Creek | - | - | - | - | Lagoon |
| Rural Subdivision and MHP | S | Crow Creek | - | - | - | - | Lagoon |

# DISCHARGE INVENTORY

## BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Birmingham | M | Cedar Creek | - | 0.014 | Controlled Discharge | Step 3 & 15 Month | - |
| Raid Quarry Co., Cedar Quarry | I | Cedar Creek | - | 0.031 | - | - | Quarry Dewatering |
| Stockport | M | Cedar Creek | - | - | Controlled Discharge | - | No Needs |
| Hillsboro | M | Cedar Creek | - | - | Controlled Discharge | - | - |
| Salem | M | Fish Creek | - | 0.035 | Controlled Discharge | 6-1-78 | - |
| Mt. Pleasant | M | Big Creek | $BOD_5$<br>$NH_3$ | 0.988 | 10 mg/1<br>5 mg/1 | 9-1-78 | - |
| Green Valley Court, Inc. | S | Big Creek | - | - | - | - | Lagoon |
| Mardan MHP | S | Big Creek | - | 0.003 | - | - | 2 - Cell Lagoon |
| Mt. Pleasant Public Utilities | I | Big Creek | - | 0.001 | - | - | - |
| Douds Stone Products | I | Big Creek | - | 0.050 | - | - | Quarry Dewatering |
| New London WTP | S | Big Creek | - | - | - | - | To STP |
| New London | M | Big Creek | $BOD_5$<br>$NH_3$ | 0.254 | 10 mg/1<br>5 mg/1 | Step 3 & 15 Month | - |

DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Geode State Park | S | Skunk River | - | - | - | - | Lagoon |
| Geode State Park | S | Skunk River | - | - | - | - | Lagoon |
| Danville | M | Long Creek | - | 0.103 | Controlled Discharge | - | - |
| Raid Quarries Corp, Heinold Quarry | I | Brush Creek | - | 0.203 | - | - | - |
| Iowa Ammunition Plant | I | Brush Creek | - | 0.8 | - | - | Imhoff Tank |
| First Mississippi, Inc. | I | Mississippi River | - | - | - | - | Cooling Tower and Boiler Blowdown, and Sanitary Discharge |
| Ft. Madison WTP | S | Mississippi River | - | 0.050 | - | - | Lime sludge and Filter Backwash |
| Ft. Madison STP | M | Mississippi River | $BOD_5$ | 3.516 | 30 mg/1 | - | - |
| Armour-Dial, Inc. | I | Mississippi River | BOD | 1.2 | 333 lbs. | - | Treated Process Water, Treated Domestic Waste, Untreated Cooling Water |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Consolidated Packaging Co., Crandon Mill | I | Mississippi River | $BOD_5$ | 0.685 | 1570 lbs. | - | Process Wastewater and Cooling Water |
| Atchison, Topeka, & Santa Fe Railway Co. | I | Mississippi River | - | - | - | - | Storm Water Runoff |
| W.A. Scheaffer Pen Co. | I | Mississippi River | Chromium<br>Nickel<br>Cyanide | 0.960 | 30 mg/1<br>30 mg/1<br>30 mg/1 | - | - |
| E.I. duPont de Nemours & Co. | I | Taylor Slough | - | 1.3 | - | - | Cooling Water and Blowdown Discharge |
| John H. Breck, Inc. | I | Taylor Slough | - | 1.2 | - | - | Cooling Water |
| Ft. Madison STP, Westerly Lagoon | M | Mississippi River | $BOD_5$ | 0.028 | 30 mg/1 | - | No Needs |
| Busard Trailer Court | S | Drainage Ditch | - | - | - | - | 2 Cell Lagoon |
| Chevron Chemical Co. | I | Mississippi River | $NH_3$ - N<br>$NO_3$ - N | 60.0 | 1200 lbs.<br>1200 lbs. | - | Holding Pond |
| Houghton | M | West Branch Little Sugar Creek | | 0.018 | Controlled Discharge | - | - |

## DISCHARGE INVENTORY

BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Raid Quarries Corp., Hawkeye Quarry | I | West Branch Little Sugar Creek | - | 0.023 | - | - | Quarry Dewatering |
| Franklin | M | West Branch Little Sugar Creek | - | - | - | - | No Treatment |
| West Point WTP | S | Devils Creek | - | 0.003 | - | - | Iron Filter Backwash to STP |
| West Point | M | Devils Creek | $BOD_5$ | 0.070 | 30 mg/1 | Step 3 & 15 Month | - |
| Frehauf Factory | I | Mississippi River | - | 0.0125 | - | - | Extended Aeration |
| American Metal Climax | I | Mississippi River | Copper<br>Molybdenum | 0.250 | 30 mg/1<br>30 mg/1 | - | - |
| Scenic View MHP | S | Mississippi River | - | - | - | - | Lagoon |
| Montrose | M | Mississippi River | $BOD_5$ | 0.04 | 30 mg/1 | - | No Needs |
| Anderson MHP | S | Mississippi River | - | - | - | - | Lagoon |
| Lee County Home | S | Drainage Ditch | - | - | - | - | Lagoon |
| Phillips Mobile Village | S | Price Creek | - | 0.018 | - | - | 2 Cell Lagoon |

## DISCHARGE INVENTORY

BASIN -

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Skyview MHP | S | Price Creek | - | - | - | - | Lagoon |
| Claude Green MHP | S | Mississippi River | - | - | - | - | Septic Tank |
| Keokuk STP, Hazelhurst Plant | M | Mississippi River | $BOD_5$ | 0.017 | 30 mg/l | - | No Needs |
| Burlington Northern, Inc. | I | Bloody Run Creek | - | - | - | - | Septic Tank |
| Midwest Carbide Corp. | I | Mississippi River | - | 0.048 | - | - | Contact Cooling Water |
| Sheller Globe Corp. | I | Soap Creek | - | 0.030 | - | - | Spray Cooling and Holding Pond |
| Hubinger Co. | I | Mississippi River | - | 5.125 | - | - | Contact Cooling Water & Process Water Discharge |
| Union Electric | I | Mississippi River | - | 1.877 | - | - | Discharge Plant Sump Collection Water From Equipment Drain |
| Keokuk WTP | S | Mississippi River | - | 3.57 | - | - | Lime Sludge Discharge |
| Keokuk Water Pollution Control Plant | M | Mississippi River | $BOD_5$ | 3.2 | 85 mg/l | - | No Needs |

## DISCHARGE INVENTORY

### BASIN - Skunk

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Keokuk Steel Casting | I | Mississippi River | - | 0.264 | - | - | Cooling Water and Runoff Discharge |
| Foote Mineral | I | Mississippi River | - | 0.5 | - | - | Surface Roof Drainage, Cooling Water, Water From Slag Settling Pond Discharge |

D = Design

E = Engineers Estimate

M = Municipal

I = Industrial

S = Semipublic

# DES MOINES

# DISCHARGE INVENTORY

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Ledyard | M | Drainage Ditch No. 80 | $BOD_5$<br>$NH_3$ | 0.024 | 30 mg/1<br>15 mg/1 | - | No Treatment |
| Lakota | M | Union Slough Outlet | $BOD_5$<br>$NH_3$ | 0.039 | 30 mg/1<br>15 mg/1 | - | No Treatment |
| Buffalo Center | M | Drainage Ditch No. 7 | - | 0.100 | Controlled Discharge | 10-01-79 | - |
| Rake | M | Drainage Ditch No. 64 | $BOD_5$<br>$NH_3$ | 0.033 | 30 mg/1<br>15 mg/1 | - | No Treatment |
| Estherville Municipal Light Plant | I | West Fork Des Moines River | - | 0.057 | - | - | Cooling Water Discharge |
| Wadco Foods | I | West Fork Des Moines River | $BOD_5$ | 0.30 | 14 mg/1 | - | Discharges to Estherville STP |
| Hallett Construction Company | I | West Fork Des Moines River | - | 0.050 | - | - | Sand and Gravel Wash |
| Estherville WTP | S | West Fork Des Moines River | - | 0.090 | - | - | Backwash from Softeners and Filters |
| Estherville | M | West Fork Des Moines River | $BOD_5$<br>$NH_3$ | 2.025 | 10 mg/1<br>2 mg/1 | - | Advanced Treatment Under Construction |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Morell & Company | I | West Fork Des Moines | $BOD_5$ | 0.37 | 150 mg/1 | - | Total detention lagoon for boiler blow down; scald water and dehair water. Other discharges to Estherville STP |
| Gruver | M | Drainage Ditch No. 60 | - | - | Controlled Discharge | - | - |
| Wallingford | M | West Fork Des Moines River | - | - | Controlled Discharge | - | - |
| Graettinger | M | West Fork Des Moines River | - | 0.185 | Controlled Discharge | Step 3 + 15 months | - |
| Emmetsburg WTP | S | West Fork Des Moines River | - | 0.044 D | - | - | Filter Backwash |
| Texaco, Inc. | I | West Fork Des Moines River | - | - | - | - | Storm Water Runoff |
| Emmetsburg | M | West Fork Des Moines River | $BOD_5$<br>$NH_3$ | 0.222 | 10 mg/1<br>2 mg/1 | - | No Needs |
| Ayshire | M | Silver Creek | - | - | Controlled Discharge | - | - |
| Cylinder | M | Cylinder Creek | - | - | Controlled Discharge | - | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Rodman | M | Cylinder Creek | - | - | - | - | No Treatment |
| West Bend WTP | S | Prairie Creek | - | 0.010 D | - | - | Backwash Water |
| West Bend | M | Prairie Creek | $BOD_5$<br>$NH_3$ | 0.077 | 30 mg/1<br>15 mg/1 | - | - |
| Curlew | M | Beaver Creek | - | - | - | - | No Treatment |
| Mallard | M | Beaver Creek | - | 0.054 D | Controlled Discharge | - | - |
| Plover | M | Pilot Creek | - | - | - | - | No Treatment |
| Rolfe WTP | S | Pilot Creek | - | 0.02 | - | - | - |
| Rolfe | M | Pilot Creek | - | 0.032 | Controlled Discharge | - | - |
| Bradgate | M | West Fork Des Moines River | - | - | - | - | No Treatment |
| P & M Stone, Inc. (Bradgate Quarry) | I | West Fork Des Moines River | - | 5.04 | - | - | Quarry Dewatering |
| Rutland | M | West Fork Des Moines River | - | - | Controlled Discharge | - | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Welp & McCarten, Inc. (Anderson Quarry) | I | West Fork Des Moines River | - | 1.00 | - | - | Quarry Dewatering |
| Humboldt WTP | S | West Fork Des Moines River | - | 0.010 | - | - | - |
| Humboldt | M | West Fork Des Moines River | $BOD_5$<br>$NH_3$ | 0.683 | 30 mg/1<br>7 mg/1 | 12-01-77 | - |
| Welp & McCarten, Inc. (Griffith Quarry) | I | Indian Creek | - | 1.0 | - | - | Quarry Dewatering |
| Dolliver | M | Soldier Creek | - | - | - | - | No Treatment |
| Armstrong | M | East Fork Des Moines River | - | 0.089 | Controlled Discharge | - | - |
| Swea City | M | Mud Creek | - | 0.047 | Controlled Discharge | - | - |
| Bancroft WTP | S | Mud Creek | - | - | - | - | Backwash Water |
| Bancroft | M | Mud Creek | - | 0.099 | Controlled Discharge | - | - |
| Burt | M | East Fork Des Moines River | - | 0.157 | Controlled Discharge | - | - |
| Titonka WTP | S | Buffalo Creek | - | - | - | - | Softening and Filter Backwash Water |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Titonka | M | Buffalo Creek | $BOD_5$<br>$NH_3$ | 0.056 | 30 mg/1<br>15 mg/1 | - | - |
| Oak Lake Development | S | East Fork Des Moines River | - | - | - | - | Lagoon |
| Ringsted WTP | S | Black Cat Creek | - | - | - | - | No Treatment |
| Ringsted | M | Black Cat Creek | - | 0.043 | Controlled Discharge | Step 3 + 15 months | - |
| Sentral Community School | S | Black Cat Creek | - | 0.006 D | - | - | Imhoff Tank, Trickling Filter. |
| Fenton | M | Black Cat Creek | - | - | Controlled Discharge | - | - |
| Lone Rock | M | Calmus Creek | - | - | - | - | No Treatment |
| Algona WTP | S | East Fork Des Moines River | - | 0.03 | - | - | Filter Backwash |
| Algona | M | East Fork Des Moines River | $BOD_5$<br>$NH_3$ | 0.552 | 30 mg/1<br>6 mg/1 | Step 3 + 15 months | - |
| Culligan Water Conditioning | I | East Fork Des Moines River | - | 0.01 | - | - | Backwash Water |
| Cook, Inc. | I | East Fork Des Moines River | - | - | - | - | Cooling Water |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Bituminous Mat. & Supply Company | I | East Fork Des Moines River | - | - | - | - | Backwash Water |
| Burr Oak Manor | S | East Fork Des Moines River | - | 0.015 D | - | - | Acitvated Sludge |
| Kossuth Co. Park | S | East Fork Des Moines River | - | 0.002 D | - | - | Septic Tank and Tile Field |
| Livermore | M | East Fork Des Moines River | - | 0.033 | Controlled Discharge | - | - |
| Whittemore WTP | S | Lotts Creek | - | 0.024 | - | - | Backwash Water |
| Whittemore | M | Lotts Creek | $BOD_5$<br>$NH_3$ | 0.0251 | 30 mg/1<br>7.5 mg/1 | Step 3 + 15 months | - |
| Bode | M | Trulner Creek | - | 0.017 | Controlled Discharge | - | - |
| Ottosen | M | Bloody Run Creek | - | - | - | - | No Treatment |
| Hardy | M | Drainage Ditch No. 4 | - | - | - | - | No Treatment |
| P. & M. Stone, Inc. (Hodge Quarry) | I | East Fork Des Moines River | - | 0.36 | - | - | Quarry Dewatering |
| Dakota City | M | East Fork Des Moines River | $BOD_5$<br>$NH_3$ | 0.044 | 30 mg/1<br>15 mg/1 | Step 3 + 15 months | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Corn Belt Power Coop | I | Des Moines River | - | 30.00 | - | - | Cooling Water |
| Farmegg Production, Inc. | I | Bass Creek | - | - | - | - | Complete Retention Lagoon |
| Pioneer | M | Deer Creek | - | - | - | - | No Treatment |
| Badger | M | Badger Creek | - | 0.032 | Controlled Discharge | - | - |
| Pocahontas Rendering Co. | I | Lizard Creek | - | - | - | - | Discharge to Municipal STP |
| Iowa Industrial Hydraulics, Inc. | I | Lizard Creek | - | - | - | - | Discharge to Municipal STP |
| Pocahontas | M | Lizard Creek | $BOD_5$ | 0.236 | 30 mg/1 | 11-01-80 | - |
| Midwest Limestone Company | I | Lizard Creek | - | 0.050 | - | - | Quarry Dewatering |
| Havelock | M | North Branch Lizard Creek | $BOD_5$<br>$NH_3$ | 0.026 | 30 mg/1<br>15 mg/1 | - | No Treatment |
| Hallett Construction | I | North Branch Lizard Creek | - | 1.5 | - | - | Quarry Dewatering |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Gilmore City | M | Drainage Ditch No. 168 | - | 0.087 | Controlled Discharge | - | - |
| Clare | M | Lizard Creek | - | 0.030 D | Controlled Discharge | - | No Needs |
| Palmer | M | South Branch Lizard Creek | $BOD_5$<br>$NH_3$ | 0.028 | 30 mg/1<br>15 mg/1 | - | - |
| Barnum | M | South Branch Lizard Creek | - | - | Controlled Discharge | - | No Needs |
| Welp & McCarten, Inc. | I | South Branch Lizard Creek | - | 0.123 | - | - | Quarry Dewatering |
| Moorland | M | Spring Creek | $BOD_5$<br>$NH_3$ | 0.031 | 30 mg/1<br>15 mg/1 | - | - |
| Fort Dodge Municipal Airport | S | Des Moines River | - | 0.0085 | - | - | Total Retention Lagoons |
| Hormel & Company | I | Des Moines River | - | 0.315 | - | - | Cooling water discharge to river, other wastes to Municipal STP. |
| Fort Dodge WTP | S | Des Moines River | - | 0.150 | - | - | Filter Backwash |
| Fort Dodge Creamery | I | Des Moines River | - | 0.200 | - | - | To Fort Dodge STP |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| American Can Company | I | Des Moines River | - | 0.02 | - | - | Cooling Water |
| Fort Dodge | M | Des Moines River | $BOD_5$<br>$NH_3$ | 3.367 | 21 mg/1<br>4 mg/1 | Under Construction | - |
| Oak Park MHP | S | Des Moines River | - | - | - | - | Extended Aeration, Polishing Pond |
| Culligan Water Conditioning | I | Des Moines River | - | - | - | - | Backwash |
| Land O' Lakes | I | Des Moines River | $BOD_5$<br>$NH_3$ | 0.46 | 15 mg/1<br>2 mg/1 | - | Cooling water to stream. Other wastes to Municipal STP. |
| Iowa Beef Processors | I | Des Moines River | $BOD_5$<br>$NH_3$ | 1.100 | 36 mg/1<br>10 mg/1 | - | No discharge below river flow of 40 cfs. |
| Coats Utility Company | I | Des Moines River | - | 0.0095 D | - | - | Lagoon |
| Savage Sanitary District | M | Des Moines River | - | 0.05 D | Controlled Discharge | - | - |
| U. S. Gypsum Co. | I | Des Moines River | - | 0.223 | - | - | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Webster Processing Company | I | Des Moines River | - | 0.05 D | - | - | Lagoon |
| National Gypsum Company | I | Des Moines River | - | 0.078 | - | - | - |
| Otho | M | Des Moines River | - | 0.057 | Controlled Discharge | - | - |
| Northern Natural Gas Company | I | Soldier Creek | - | 0.090 | - | - | - |
| Farmland Industries | I | Holiday Creek | $BOD_5$<br>$NH_3$ | 0.60 | 50 lbs.<br>88 lbs. | - | Lagoon |
| Lehigh | M | Crooked Creek | - | 0.047 | Controlled Discharge | - | - |
| Dickey Clay Manufacturing | I | Crooked Creek | - | 0.054 | - | - | - |
| Vincent | M | Brushy Creek | - | 0.027 D | Controlled Discharge | - | - |
| Duncombe | M | Brushy Creek | - | 0.022 | Controlled Discharge | - | - |
| Vista Acres MHP | S | Drainage Ditch No. 54 | - | - | - | - | Extended Aeration, Polishing Pond |

## DISCHARGE INVENTORY

### BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Corwith | M | Boone River | - | 0.023 | Controlled Discharge | - | - |
| Britt WTP | S | Middle Branch Boone River | - | 0.229 | - | - | Filter Backwash |
| Britt | M | Middle Branch Boone River | $BOD_5$<br>$NH_3$ | 0.242 | 30 mg/1<br>2 mg/1 | Step 3 + 15 months | - |
| Wesley | M | Prairie Creek | - | - | Controlled Discharge | - | No Needs |
| Luverne | M | Prairie Creek | - | 0.043 D | Controlled Discharge | - | - |
| Renwick | M | Joint Drainage Ditch No. 3 | - | 0.076 | Controlled Discharge | - | - |
| Kanawha | M | West Otter Creek | - | 0.083 | Controlled Discharge | - | - |
| Goldfield | M | Boone River | - | 0.024 | Controlled Discharge | Step 3 + 15 months | - |
| Northern Natural Gas Company | I | Boone River | - | 0.025 | - | - | - |
| Thor | M | Drainage Ditch No. 3 | - | - | Controlled Discharge | - | No Needs |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Boone Valley Coop | I | Drainage Ditch No. 94 | - | 0.155 | - | - | Cooling Water |
| Iowa Public Service | I | Drainage Ditch No. 94 | - | 0.016 | - | - | Cooling Water |
| Eagle Grove WTP | S | Drainage Ditch No. 94 | - | 0.026 | - | - | Process Water |
| Eagle Grove | M | Drainage Ditch No. 94 | $BOD_5$<br>$NH_3$ | 0.652 | 10 mg/1<br>2 mg/1 | 7-01-77 | - |
| Clarion | M | Drainage Ditch Nc. 2 | $BOD_5$<br>$NH_3$ | 0.261 | 30 mg/1<br>2 mg/1 | 12-01-79 | - |
| Woolstock | M | Eagle Creek | - | - | Controlled Discharge | - | No Needs |
| Webster City WTP | S | Boone River | - | 0.029 | - | - | - |
| Webster City | M | Boone River | $BOD_5$<br>$NH_3$ | 1.582 | 10 mg/1<br>2 mg/1 | 11-30-77 | - |
| Franklin Manufacturing | I | Boone River | $BOD_5$<br>$NH_3$ | 0.46 | 20 mg/1<br>0.8 mg/1 | - | Holding Lagoon |
| Webster City Municipal Light and Power | I | Boone River | - | 11.52 | - | - | Cooling Water |

DISCHARGE INVENTORY

BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Weaver Construction Company (Moberly Mine) | I | Boone River | - | 3.6 | - | - | - |
| Stratford | M | Des Moines River | $BOD_5$<br>$NH_3$ | 0.060 | 30 mg/1<br>15 mg/1 | - | No Needs |
| Dayton | M | Skillet Creek | $BOD_5$<br>$NH_3$ | 0.150 | 30 mg/1<br>15 mg/1 | 10-01-78 | - |
| Boone County Home | S | Poor Farm Creek | - | 0.008 D | - | - | Lagoon |
| Episcopal Center and Conference Camp | S | Poor Farm Creek | - | 0.007 D | - | - | Septic Tank |
| Fraser | M | Des Moines River | - | - | - | - | No Treatment |
| Boxholm | M | Bluff Creek | - | - | Controlled Discharge | - | No Needs |
| Pilot Mound | M | Bluff Creek | - | - | Controlled Discharge | - | No Needs |
| Boone WTP | S | Honey Creek | - | 0.064 | - | - | Backwash |
| Boone | M | Honey Creek | $BOD_5$<br>$NH_3$ | 1.99 | 20 mg/1<br>5 mg/1 | 12-01-78 | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Sandler Built Homes | I | Honey Creek | - | - | - | - | Discharges to City STP. |
| Camp Laurie | S | Des Moines River | - | 0.010 D | - | - | - |
| Assemblies of God | S | Des Moines River | - | - | - | - | Total Retention Lagoon |
| Luther | M | Des Moines River | - | - | - | - | Maintain Septic Tanks |
| Country Air MHP | S | Des Moines River | - | - | - | - | Total Retention Lagoon |
| Woodward State Institution | S | Preston Branch | $BOD_5$ | 0.20 | 25 mg/1 | - | Trickling Filter |
| Sheldahl | M | Big Creek | - | 0.0375 D | - | - | No Treatment |
| Madrid | M | Little Creek | $BOD_5$ | 0.198 | 30 mg/1 | - | - |
| Plains Poultry Farm, Inc. | I | Little Creek | - | 0.011 | - | - | 5 Cell Lagoon |
| Polk City | M | Big Creek | - | 0.070 | Controlled Discharge | - | Part of Des Moines 208 Plan |
| Jester Park | S | Des Moines River | $BOD_5$ | - | 45 mg/1 | - | Lagoon |
| Ankeny Ind. | M | Rock Creek | $BOD_5$<br>$NH_3$ | 0.130 | 15 mg/1<br>7.5 mg/1 | - | John Deere Industrial Waste Treatment |
| Saylorville Lake Recreation Area | S | Des Moines River | - | 0.30 D | - | - | Lagoon |

## DISCHARGE INVENTORY

### BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| YMCA Boys Home of Iowa | S | Des Moines River | $BOD_5$ | - | 43 mg/1 | - | Lagoon |
| Camp Dodge | S | Des Moines River | $BOD_5$ | 0.060 | 25 mg/1 | - | Trickling Filter |
| Grand Junction | M | Beaver Creek | $BOD_5$<br>$NH_3$ | 0.04 | 15 mg/1<br>9 mg/1 | Step 3 + 15 Months | - |
| Beaver | M | Beaver Creek | - | - | - | - | No Treatment |
| Ogden | M | East Beaver Creek | $BOD_5$<br>$NH_3$ | 0.342 | 15 mg/1<br>9 mg/1 | Step 3 + 15 Months | - |
| Berkley | M | Beaver Creek | - | - | - | - | No Treatment |
| Woodward | M | Beaver Creek | - | 0.084 | Controlled Discharge | - | - |
| Bouton | M | Beaver Creek | - | - | - | - | Maintain Septic Tanks |
| Town & Country, Inc. | S | Beaver Creek | - | 0.0065 D | - | - | Lagoon |
| Granger | M | Beaver Creek | - | 0.0060 | Controlled Discharge | 2-01-81 | - |
| Grimes | M | Beaver Creek | $BOD_5$<br>$NH_3$ | 0.10 | 10 mg/1<br>2 mg/1 | - | - |
| Beaver Valley Canning Company | I | Little Beaver Creek | - | 0.063 | - | - | To Grimes STP. |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Johnston | M | Beaver Creek | - | - | - | - | Part of Des Moines 208 Plan |
| Urbandale Sanitary Sewer District | M | Beaver Creek | $BOD_5$<br>$NH_3$ | 0.30 | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| First Continental Company Motel | S | Beaver Creek | - | 0.025 D | - | - | Extended Aerating, Polishing Lagoon |
| Ankeny West | M | Saylor Creek | $BOD_5$<br>$NH_3$ | 0.517 | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| Mel Ray MHP | S | Saylor Creek | $BOD_5$ | - | 45 mg/1 | - | Lagoon |
| Iowa Fund | I | Walfley Creek | $BOD_5$ | 0.015 | 80 mg/1 | - | Lagoon |
| Mid Continent Industries | I | Walfley Creek | $BOD_5$<br>$NH_3$ | 0.050 | 31 mg/1<br>1 mg/1 | - | Aerated Lagoons |
| Firestone Tire & Rubber Company | I | Walfley Creek | $BOD_5$ | 1.270 | 5 mg/1 | - | Cooling and Process Water |
| American Can Co. | I | Walfley Creek | - | 0.202 | - | - | Cooling Water |
| Regency Manor MHP | S | Walfley Creek | - | - | - | - | Lagoon |
| Marathon | M | North Raccoon River | - | - | Controlled Discharge | - | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Rembrandt | M | North Raccoon River | - | 0.015 | Controlled Discharge | - | - |
| Albert City | M | Lateral 2 | $BOD_5$<br>$NH_3$ | 0.080 | 30 mg/l<br>8 mg/l | 12-01-79 | - |
| Truesdale | M | Poor Farm Creek | - | - | - | - | No Treatment |
| Storm Lake WTP | M | Boyer Creek | - | 0.008 | - | - | Lime Sludge Discharge |
| Iowa Public Service | I | Boyer Creek | $BOD_5$ | 0.1 | 3 mg/l | - | Cooling Water |
| Storm Lake | M | Boyer Creek | $BOD_5$<br>$NH_3$ | 1.516 | 30 mg/l<br>2 mg/l | Step 3 + 21 Months | - |
| Storm Lake Hygrade | M | Boyer Creek | $BOD_5$<br>$NH_3$ | 1.045 | 20 mg/l<br>2 mg/l | 5-01-78 | - |
| County Village MHP | S | Boyer Creek | - | - | - | - | Lagoon |
| Villas & Company, Inc. | S | Boyer Creek | - | 0.0986 | - | - | Cooling Water |
| Vista Products, Company | I | Boyer Creek | $BOD_5$<br>$NH_3$ | 0.180 | 28 mg/l<br>2 mg/l | - | Cooling Water |
| Lakeside | M | Boyer Creek | - | - | - | - | Discharge to Storm Lake Hy-Grade. |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Nemaha | M | North Raccoon River | - | - | - | - | Septic Tanks |
| Sac City WTP | S | North Raccoon River | - | 0.0055 | - | - | Filter Backwash |
| Sac Ctiy | M | North Raccoon River | $BOD_5$<br>$NH_3$ | 0.270 | 30 mg/1<br>2 mg/1 | 8-01-77 | - |
| Sac County Road Gravel | I | North Raccoon River | - | 0.050 | - | - | Quarry Dewatering |
| Laurens WTP | S | Cedar Creek | - | - | - | - | Filter Backwash |
| Laurens | M | Cedar Creek | $BOD_5$<br>$NH_3$ | 0.160 | 30 mg/1<br>2 mg/1 | Step 3 + 15 months | - |
| Mefferd Industries | I | Cedar Creek | - | - | - | - | Chrome Rinse Tanks |
| Varina | M | Cedar Creek | - | - | - | - | No Treatment |
| Fonda WTP | S | Cedar Creek | - | - | - | - | Filter Backwash |
| Fonda | M | Cedar Creek | $BOD_5$<br>$NH_3$ | 0.088 | 30 mg/1<br>2 mg/1 | 3-01-79 | - |
| Newell WTP | S | Prairie Creek | - | - | - | - | Filter Backwash |
| Newell | M | Prairie Creek | $BOD_5$<br>$NH_3$ | 0.087 | 30 mg/1<br>2 mg/1 | 1-01-79 | - |

## DISCHARGE INVENTORY

### BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Buena Vista Co. Gravel Pit | I | Prairie Creek | - | 2.0 | - | - | - |
| Lake View | M | Indian Creek | $BOD_5$<br>$NH_3$ | 0.218 | 30 mg/1<br>4 mg/1 | Step 3 + 15 Months | - |
| Auburn | M | North Raccoon River | - | - | Controlled Discharge | - | No Needs |
| Jolley | M | Camp Creek | - | - | - | - | No Treatment |
| Lytton WTP | S | Camp Creek | - | - | - | - | To Municipal Lagoons |
| Lytton | M | Camp Creek | - | 0.157 | Controlled Discharge | - | - |
| Yetter | M | Camp Creek | - | - | - | - | No Treatment |
| Pomeroy | M | Lake Creek | - | 0.073 | Controlled Discharge | - | - |
| Rockwell City Women's Reformatory | S | Lake Creek | $BOD_5$<br>$NH_3$ | 0.007 | 25 mg/1<br>1.5 mg/1 | - | Lagoon |
| Rockwell City | M | Lake Creek | $BOD_5$<br>$NH_3$ | 0.264 | 30 mg/1<br>7 mg/1 | 8-01-80 | - |
| Lake City N. | M | Lake Creek | $BOD_5$<br>$NH_3$ | 0.090 | 30 mg/1<br>5 mg/1 | 9-01-78 | - |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Lake City S.W. | M | Lake Creek | $BOD_5$<br>$NH_3$ | 0.080 | 30 mg/1<br>5 mg/1 | 9-01-78 | - |
| Twin Lake Travel Park | S | Lake Creek | - | - | - | - | - |
| Lanesboro | M | North Raccoon River | - | - | Controlled Discharge | - | - |
| Manson | M | Cedar Creek | - | 0.110 | Controlled Discharge | - | - |
| Knierim | M | Cedar Creek | - | - | - | - | No Treatment |
| Somers | M | Cedar Creek | - | - | - | - | Maintain Septic Tanks |
| Rinard | M | Cedar Creek | $BOD_5$<br>$NH_3$ | 0.003 | 30 mg/1<br>15 mg/1 | - | - |
| Lohrville | M | Cedar Creek | $BOD_5$<br>$NH_3$ | 0.053 | 30 mg/1<br>15 mg/1 | Step 3 + 15 months | - |
| Crossroads | S | Drainage Ditch No. 171 | - | 0.004 D | - | - | Septic tanks, Sand Filter |
| Scranton | M | Drainage Ditch No. 171 | $BOD_5$<br>$NH_3$ | 0.065 | 30 mg/1<br>15 mg/1 | Step 3 + 15 Months | - |

## DISCHARGE INVENTORY

### BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Jefferson WTP | S | Drainage Ditch No. 132 | - | 0.100 | - | - | Backwash |
| Jefferson | M | Drainage Ditch No. 132 | $BOD_5$<br>$NH_3$ | 0.485 | 30 mg/1<br>6 mg/1 | 10-31-79 | - |
| Shriver-Van Hormer | I | Drainage Ditch No. 132 | - | - | - | - | Septic Tank, Tile Field |
| Farnhamville WTP | S | Hardin Creek | - | 0.0024 | - | - | Backwash |
| Farnhamville | M | Hardin Creek | - | 0.110 | Controlled Discharge | Step 3 + 15 months | - |
| Churdan | M | Hardin Creek | - | 0.028 | Controlled Discharge | 12-01-78 | - |
| Callendar | M | Butterick Creek | - | 0.020 | Controlled Discharge | - | - |
| Gowrie WTP | S | Butterick Creek | - | - | - | - | - |
| Gowrie | M | Butterick Creek | $BOD_5$<br>$NH_3$ | 0.188 | 30 mg/1<br>15 mg/1 | Step 3 + 15 months | - |
| Harcourt | M | Butterick Creek | - | - | Controlled Discharge | - | - |
| Paton | M | Butterick Creek | - | - | Controlled Discharge | - | No Needs |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Dana | M | Butterick Creek | - | - | - | - | No Treatment |
| Jamaica | M | North Raccoon River | - | - | Controlled Discharge | - | - |
| Rippey | M | Snake Creek | - | 0.012 | Controlled Discharge | Step 3 + 15 months | - |
| Dawson | M | North Raccoon River | - | - | Controlled Discharge | - | - |
| Osmund Manufacturing Company | I | North Raccoon River | - | 0.011 D | - | - | Lagoon |
| Perry WTP | S | North Raccoon River | - | - | - | - | Lime Sludge and Filter Backwash |
| Perry | M | North Raccoon River | $BOD_5$<br>$NH_3$ | 1.052 | 30 mg/1<br>2 mg/1 | 10-01-79 | - |
| Oscar Mayer Co. | I | North Raccoon River | $BOD_5$<br>$NH_3$ | 0.67 | 75 mg/1<br>70 mg/1 | - | Anaerobic, Aerobic Lagoons |
| Iowa Electric Light & Power Co. | I | North Raccoon River | - | - | - | - | Boiler Blowdown, Cooling Water, and Wash Water. |
| Minburn | M | North Raccoon River | - | 0.032 | Controlled Discharge | - | - |
| Dallas County Home | S | North Raccoon River | - | - | - | - | No Treatment |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Adel WTP | S | North Raccoon River | - | - | - | - | Iron and Brine Wastes |
| Adel | M | North Raccoon River | $BOD_5$<br>$NH_3$ | 0.400 | 30 mg/1<br>2 mg/1 | 10-01-78 | - |
| Guthrie Center | M | South Raccoon River | $BOD_5$<br>$NH_3$ | 0.186 | 30 mg/1<br>15 mg/1 | 9-01-78 | - |
| Arcadia | M | Brushy Creek | - | - | Controlled Discharge | - | No Needs |
| Halbur | M | Brushy Creek | - | - | Controlled Discharge | - | - |
| Dedham | M | Brushy Creek | - | 0.009 | Controlled Discharge | - | - |
| Stuart | M | Long Branch | $BOD_5$ | 0.201 | 30 mg/1 | Step 3 + 15 months | - |
| Diamond Lake | S | Long Branch | $BOD_5$<br>$NH_3$ | 0.025 | 25 mg/1<br>5 mg/1 | - | Lagoon |
| Breda | M | Middle Raccoon River | - | 0.065 | Controlled Discharge | - | - |
| Carroll | M | Middle Raccoon River | $BOD_5$<br>$NH_3$ | 0.805 | 20 mg/1<br>6.5 mg/1 | Step 3 + 15 months | - |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Bernholt Brothers Frozen Foods & Locker | I | Middle Raccoon | - | - | - | - | Cooling Water |
| Carroll Rendering Works | I | Middle Raccoon River | - | 0.08 D | - | - | Anaerobic, Aerobic Lagoon System |
| Farner-Bocken Company | I | Middle Raccoon River | - | 0.003 | - | - | Cooling Water |
| Iowa Public Service Company - Carroll Station | I | Middle Raccoon River | - | - | - | - | Recycle Cooling Water |
| Lidderdale WTP | S | Storm Creek | - | - | - | - | Backwash Water |
| Lidderdale | M | Storm Creek | - | 0.015 | Controlled Discharge | - | - |
| Willey | M | Middle Raccoon River | - | - | - | - | No Treatment |
| Coon Rapids | M | Middle Raccoon River | $BOD_5$ | 0.081 | 30 mg/1 | - | No Needs |
| Glidden WTP | S | Storm Creek | - | 0.003 | - | - | Backwash |
| Glidden | M | Willow Creek | $BOD_5$ | 0.062 | 30 mg/1 | 9-01-78 | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Ralston | M | Willow Creek | - | - | - | - | No Treatment |
| Bayard | M | Willow Creek | $BOD_5$ | 0.070 | 30 mg/1 | - | - |
| Spring State Park | S | Middle Raccoon River | - | - | - | - | Total Retention Lagoon |
| Lake Panorama | S | Middle Raccoon River | - | - | - | - | Discharge to Municipal Lagoon When Constructed |
| Panora WTP | S | Middle Raccoon | - | 0.01 | - | - | Coagulation Sludge |
| Panora | M | Middle Raccoon River | - | 0.150 | Controlled Discharge | - | - |
| Linden | M | Middle Raccoon River | $BOD_5$<br>$NH_3$ | 0.038 | 30 mg/1<br>15 mg/1 | - | - |
| Bagley | M | Mosquito Creek | $BOD_5$<br>$NH_3$ | 0.39 | 30 mg/1<br>15 mg/1 | Step 3 + 15 months | - |
| Yale | M | Mosquito Creek | $BOD_5$<br>$NH_3$ | 0.032 | 30 mg/1<br>15 mg/1 | - | - |
| Redfield | M | South Raccoon River | - | 0.062 | Controlled Discharge | - | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Northern IA Natural Gas Co., Redfield Compressor Area | I | South Raccoon River | - | - | - | - | Septic Tank and Tile Field |
| Northern IA Natural Gas Co., Redfield Storage Area | I | South Raccoon River | - | 0.35 | - | - | Aerated Lagoon |
| Earlham | M | Bear Creek | - | 0.236 | Controlled Discharge | Step 3 + 15 Month | - |
| Gendler Stone Products Co., Inc. | I | Bear Creek | - | 0.024 | - | - | Quarry Dewatering |
| DeSoto | M | Bugler Creek | - | 0.060 | Controlled Discharge | Step 3 + 15 Month | - |
| Van Meter | M | Raccoon River | - | 0.033 | Controlled Discharge | 11-1-78 | - |
| Prairie Village MHP | S | Raccoon River | - | - | - | - | Lagoon, No Discharge |
| Iowa Highway Commission Rest Area | S | Raccoon River | - | 0.078 | - | - | Lagoon |
| Southeast Polk Water Co. | S | Raccoon River | - | 0.006 | - | - | Backwash Water |

## DISCHARGE INVENTORY

### BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Waukee | M | Sugar Creek | $BOD_5$ | 0.300 D | 30 mg/1 | 2-1-81 | - |
| Fox Creek Water Co. | S | Sugar Creek | - | - | - | - | Backwash Water |
| Walter T. Giles High Rise Motel | S | Jordan Creek | - | - | - | - | Two Cell Lagoon |
| Dallas Center | M | Walnut Creek | $BOD_5$ | 0.188 | 30 mg/1 | Step 3 & 16 Month | - |
| Dallas Center WTP | S | Walnut Creek | - | 0.009 | - | - | - |
| Hinkson MHP | S | Walnut Creek | - | 0.005 | - | - | Lagoon |
| Des Moines Golf & Country Club | S | Walnut Creek | - | 0.05 | - | - | Aerated Lagoon |
| National Cross-roads Campground | S | Walnut Creek | - | - | - | - | Lagoon |
| Skelly Oil Co. | I | Walnut Creek | - | 0.008 | - | - | Aerated Lagoon |
| American Oil Co. | I | Walnut Creek | - | - | - | - | Runoff & Possible Oil Product Spillage |
| Roadrunner Camp-ground & MHP | S | Walnut Creek | - | - | - | - | Lagoon |
| Champlain Truck Stop | I | Walnut Creek | - | - | - | - | Lagoon |

DISCHARGE INVENTORY

BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Meredith Corp. | I | Raccoon River | - | 0.85 | - | - | Cooling Water Recycled To Des Moines Water Works |
| KOA Campgrounds | S | Raccoon River | - | - | - | - | - |
| Des Moines Water Works | S | Raccoon River | - | 0.3 | - | - | Total Retention Lagoon |
| Clive | M | Des Moines River | - | - | - | - | To Des Moines STP |
| West Des Moines | M | Des Moines River | - | - | - | - | To Des Moines STP |
| Windsor Heights | M | Des Moines River | - | - | - | - | To Des Moines STP |
| Armstrong Rubber Co. | I | Dean's Lake | $BOD_5$ | 2.85 | 8 mg/1 | - | Cooling Water |
| Chicago, Rock Island and Pacific R.R. | I | Dean's Lake | - | 0.005 | - | - | Water From Oil Traps |
| Frye Copy Systems | I | Dean's Lake | - | 0.72 | - | - | Cooling Water |
| Lennox Industries | I | Dean's Lake | - | 0.038 | - | - | Cooling Water |
| Des Moines | M | Des Moines River | $BOD_5$<br>$NH_3$ | 38.9 | 10 mg/1<br>7.5 mg/1 | - | - |

## DISCHARGE INVENTORY

BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Des Moines Area C Sanitary Lagoon | M | Yeader Creek | $BOD_5$<br>$NH_3$ | 0.3 D | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| Iowa Power & Light | I | Des Moines River | - | 150 | - | - | Three Cooling Water Discharges |
| Slater | M | Four Mile Creek | $BOD_5$ | 0.090 | 30 mg/1 | 11-10-78 | - |
| Alleman | M | Four Mile Creek | - | 0.01 | Controlled Discharge | - | - |
| Iowa Highway Commission Rest Stop | S | Four Mile Creek | - | 0.005 D | - | - | Lagoon |
| Ankeny E | M | Four Mile Creek | $BOD_5$<br>$NH_3$ | 9.910 | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| Oakwood Heights MHP | S | Four Mile Creek | - | - | - | - | Lagoon |
| Greenwood Acres WTP | S | Four Mile Creek | - | 0.001 | - | - | Backwash Water |
| Sunny Brook MHP | S | Four Mile Creek | $BOD_5$<br>$NH_3$ | 0.025 | 23 mg/1<br>8 mg/1 | - | Lagoon |
| Altoona | M | Four Mile Creek | $BOD_5$<br>$NH_3$ | 0.534 | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Country Living MHP | S | Four Mile Creek | - | - | - | - | Lagoon |
| S.E. Polk Community School | S | Des Moines River | $BOD_5$ | 0.013 | 25 mg/1 | - | Extended Aeration |
| Pleasant Hill | M | Des Moines | $BOD_5$<br>$NH_3$ | 0.110 | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| Menlo | M | North River | $BOD_5$<br>$NH_3$ | 0.041 | 30 mg/1<br>15 mg/1 | - | - |
| Dexter | M | North Branch | - | 0.075 D | Controlled Discharge | Step 3 & 15 Month | - |
| Winterset WTP | S | Cedar Creek | _ | 0.720 | - | - | Filter Backwash |
| Madison County Home | S | Cedar Creek | - | 0.005 D | - | - | Aerated Lagoon, Polishing Pond |
| E.I. Sargent | I | Cedar Creek | - | - | - | - | Quarry Dewatering |
| Schildberg | I | Cedar Creek | - | - | - | - | Quarry Dewatering |
| Cumming | M | Middle Creek | $BOD_5$<br>$NH_3$ | 0.029 | 30 mg/1<br>15 mg/1 | - | - |
| Iowa Metro Sewer | M | Windmill Creek | $BOD_5$<br>$NH_3$ | 0.100 | 37 mg/1<br>8 mg/1 | - | Lagoon |
| Norwalk | M | Windmill Creek | - | - | - | 11-1-80 | Part of Des Moines 208 Plan |

DISCHARGE INVENTORY

BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Des Moines Highland Hills | M | Windmill Creek | $BOD_5$<br>$NH_3$ | 0.525 | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| Des Moines Area B | M | Windmill Creek | $BOD_5$<br>$NH_3$ | 0.300 D | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| Des Moines Water Dev. Co. | S | Middle Creek | - | 0.015 | - | - | Backwash Water |
| Greenfield Plaza | M | Middle Creek | $BOD_5$<br>$NH_3$ | 0.350 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Carlisle | M | North River | - | 0.104 | Controlled Discharge | - | Part of Des Moines 208 Plan |
| Carlisle WTP | S | North River | - | 0.065 | - | - | Filter Backwash |
| Carlisle Sand and Gravel | I | North River | - | - | - | - | Wash Water |
| Adair | M | South Fork | $BOD_5$ | 0.057 | 30 mg/1 | - | No Needs |
| Casey | M | Middle River | $BOD_5$<br>$NH_3$ | 0.022 | 30 mg/1<br>15 mg/1 | - | No Needs |
| Menlo WTP | S | Middle River | - | 0.027 | - | - | Filter Backwash |
| Iowa Highway Commission Rest Area | | Middle River | - | 0.005 | - | - | Lagoon |
| Schildberg Construction Co. | I | Middle River | - | - | - | - | Quarry Dewatering |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Schildberg Construction Co. | I | Middle River | - | - | - | - | Quarry Dewatering (Site 2) |
| Nickerson Farms | I | Middle River | - | - | - | - | Lagoon |
| Winterset | M | Middle River | $BOD_5$<br>$NH_3$ | 0.320 | 10 mg/1<br>3 mg/1 | Step 3 & 15 Month | - |
| Patterson | M | Middle River | - | - | Controlled Discharge | - | - |
| Bevington | M | Middle River | - | - | - | - | No Treatment |
| Martinsdale | M | Middle River | - | 0.04 D | Controlled Discharge | - | - |
| E.I. Sargent | I | North Fork | - | - | - | - | Quarry Dewatering |
| East Peru | M | Clanton Creek | - | - | - | - | No Treatment |
| Truro | M | Hay Branch | - | 0.045 | Controlled Discharge | - | - |
| St. Charles | M | Unnamed Tributary | - | - | Controlled Discharge | - | - |
| Spring Hill | M | Middle River | - | - | Controlled Discharge | - | - |
| Indianola N. | M | Unnamed Tributary | $BOD_5$<br>$NH_3$ | 0.651 | 10 mg/1<br>2 mg/1 | 11-30-79 | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Hartford MHP | S | Butcher Creek | - | - | - | - | Lagoon |
| Hartford | M | Butcher Creek | $BOD_5$<br>$NH_3$ | 0.088 | 30 mg/1<br>15 mg/1 | - | - |
| Bondurant | M | Mud Creek | $BOD_5$<br>$NH_3$ | 0.047 | 15 mg/1<br>7.5 mg/1 | - | Part of Des Moines 208 Plan |
| S.E. Polk High School | S | Mud Creek | $BOD_5$<br>$NH_3$ | 0.020 | 25 mg/1<br>1 mg/1 | - | Extended Aeration |
| Runnels | M | Mud Creek | $BOD_5$ | 0.076 | 30 mg/1 | - | Part of Des Moines 208 Plan |
| St. Mary's | M | South River | - | - | - | - | No Treatment |
| Concrete Materials | I | South Squaw Creek | - | - | - | - | Quarry Operations |
| E.I. Sargent | I | South Squaw Creek | - | - | - | - | Quarry Operations |
| Iowa Promotional Man. | S | Squaw Creek | - | - | - | - | Lagoon |
| MBZ Mobile Home Park | S | Squaw Creek | - | - | - | - | Lagoon |
| New Virginia Sanitary District | M | Squaw Creek | - | 0.028 | Controlled Discharge | - | - |
| Stuckeys | I | Squaw Creek | - | 0.003 D | - | - | Package Aeration Unit (Oxigest) |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Indianola S | M | South River | $BOD_5$ | 0.45 | 30 mg/1 | 11-30-79 | - |
| S.E. Warren Community School | S | Otter Creek | - | 0.01 D | - | - | Three Cell Lagoon |
| Milo | M | Otter Creek | - | 0.048 D | Controlled Discharge | Step 3 & 15 Month | - |
| Ackworth | M | South River | - | - | - | - | Maintain Septic Tanks |
| Sandyville | M | South River | - | - | - | - | No Treatment |
| Pleasantville | M | Coal Creek | - | 0.047 | Controlled Discharge | Step 3 & 15 Month | - |
| Mitchelville | M | Camp Creek | $BOD_5$ | 0.085 | 30 mg/1 | 2-1-81 | - |
| Iowa Highway Commission Rest Stop | S | Ditch | - | - | - | - | Lagoon |
| Thomas Mitchell Park | S | Camp Creek | - | - | - | - | Lagoon |
| Prairie City | M | Calhoun Creek | $BOD_5$<br>$NH_3$ | 0.370 | 30 mg/1<br>15 mg/1 | - | No Needs |
| Monroe | M | Brush Creek | $BOD_5$<br>$NH_3$ | 0.040 | 10 mg/1<br>2 mg/1 | 7-1-79 | - |
| Elk Rock State Park | S | Des Moines River | - | - | - | - | Total Retention Lagoons |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Iowa Highway Commission | S | White Breast | - | 0.004 | - | - | Lagoon |
| Osceola E. | M | White Breast | - | 0.573 | - | - | Plan to Abandon Plant |
| Osceola S | M | White Breast | $BOD_5$ | 0.19 | 30 mg/1 | 1-1-77 | - |
| Champlain Petroleum Co. | I | White Breast | - | - | - | - | Lagoon |
| R. & R. Campground | S | White Breast | - | - | - | - | Lagoon |
| Woodburn | M | White Breast | - | - | - | - | Maintain Septic Tanks |
| Lucas | M | White Breast | $BOD_5$<br>$NH_3$ | 0.026 | 30 mg/1<br>15 mg/1 | - | - |
| Williamson | M | White Breast | $BOD_5$<br>$NH_3$ | 0.023 | 30 mg/1<br>15 mg/1 | - | - |
| Lacona Oil Co. | I | White Breast | - | - | - | - | Car Wash |
| Lacona | M | White Breast | - | 0.034 | Controlled Discharge | - | - |
| C.D. Hess & Son Rock | I | Winn Branch | - | - | - | - | Quarry Dewatering |
| Knoxville STP | M | Competine Creek | $BOD_5$ | 0.606 | 30 mg/1 | 9-1-79 | - |

# DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Knoxville WTP | S | Competine Creek | - | - | - | - | Filter Backwash |
| Red Rock Lake View Subdivision | S | Competine Creek | - | - | - | - | Lagoon |
| Knoxville V.A. Hospital | S | Unnamed Tributary | - | 0.186 | - | - | Trickling Filter |
| Marion County Home | S | Unnamed Tributary | - | - | - | - | Total Retention Lagoon |
| Pella STP | M | Sents Creek | - | 0.054 | - | 1-1-81 | In Accordance With Pella 201 Plan |
| Pella WTP | S | Sents Creek | - | 0.028 | - | - | Filter Backwash |
| Vermeer Manufacturing Co. | I | Sents Creek | - | - | - | - | Septic Tank to Holding Pond |
| Melcher | M | Tracy Creek | - | 0.10 | Controlled Discharge | - | - |
| Dallas | M | Tracy Creek | - | - | - | - | Discharge to Melcher Lagoon |
| Harvey | M | English Creek | $BOD_5$<br>$NH_3$ | 0.024 | 30 mg/1<br>15 mg/1 | - | - |
| Kaser Construction Co. | I | English Creek | - | - | - | - | Quarry Dewatering |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Kaser Construction Co. | I | English Creek | - | - | - | - | Quarry Dewatering (Site No. 2) |
| Pella Limestone Co. | I | Des Moines River | - | - | - | - | Holding Pond |
| Melrose | M | Cedar Creek | - | - | - | - | No Treatment |
| Marysville | M | Cedar Creek | - | - | - | - | No Treatment |
| Pershing Utilities Co. | I | Walnut Creek | - | 0.0001 | - | - | Filter Backwash |
| Lovilia | M | South Coal Creek | - | 0.012 | Controlled Discharge | - | - |
| Hamilton | M | South Coal Creek | - | - | Controlled Discharge | - | - |
| Twin Cedar Community School | S | South Coal Creek | - | 0.013 | - | - | Lagoon |
| Bussey | M | South Coal Creek | - | 0.02 D | Controlled Discharge | - | - |
| Monroe County Park | S | Bluff Creek | - | 0.0002 D | - | - | Lagoon |
| Martin Marietta Corp. | I | Des Moines River | - | - | - | - | Quarry Dewatering |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Kaser Construction Co. | I | Grays Creek | - | 0.005 | - | - | Quarry Dewatering |
| Concrete Mat. Div. | I | Des Moines River | - | - | - | - | Holding Ponds |
| Leighton | M | Muchakinock Creek | - | - | - | - | No Treatment |
| Beacon | M | Muchakinock Creek | - | 0.023 | Controlled Discharge | - | - |
| Oskaloosa S. | M | Little Muchakinock Creek | $BOD_5$<br>$NH_3$ | 0.051 | 30 mg/1<br>15 mg/1 | - | In Accordance With Oskaloosa 201 Plan |
| Oskaloosa S.W. | M | Little Muchakinock Creek | $BOD_5$<br>$NH_3$ | 0.410 | 30 mg/1<br>15 mg/1 | - | In Accordance With Oskaloosa 201 Plan |
| Hacherts Mobile Home | S | Little Muchakinock Creek | - | - | - | - | Total Retention Lagoon |
| Mahaska Bottling | I | Little Muchakinock Creek | - | - | - | - | No Treatment |
| Kaser Construction Co. | I | Little Muchakinock Creek | - | - | - | - | No Treatment |
| Clow Corp. | I | Little Muchakinock Creek | - | 0.013 | - | - | Cooling Water |
| Albia N. | M | Miller Creek | $BOD_5$ | 0.273 | 30 mg/1 | Step 3 & 15 Month | - |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Chamberlain Manufacturing | I | Miller Creek | - | - | - | - | No Treatment |
| Iowa Southern Utilities | I | Miller Creek | - | 1.3 | - | - | Cooling Tower and Septic Tank Discharge |
| Eddyville | M | Des Moines River | - | 0.138 | Controlled Discharge | - | - |
| Kirkville | M | Unnamed Tributary | $BOD_5$<br>$NH_3$ | 0.028 | 30 mg/1<br>15 mg/1 | - | - |
| Chillicothe | M | South Avery | - | - | - | - | Maintain Septic Tanks |
| Material Service | I | Des Moines River | - | - | - | - | Quarry Dewatering |
| Chicago, Milwaukee, St. Paul & Pacific RR | I | Bear Creek | - | 0.002 | - | - | Oil Separation Tanks |
| Woodland Hills MHP | S | Bear Creek | - | - | - | - | Lagoon |
| Ottumwa WTP | S | Des Moines River | - | 0.13 | - | - | Filter Backwash |
| Ottumwa STP | M | Des Moines River | $BOD_5$<br>$NH_3$ | 2.18 | 30 mg/1<br>15 mg/1 | - | No Needs |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Rabbit Run MHP | S | Des Moines River | - | 0.013 D | - | - | Package Extended Aeration Unit |
| George A. Hormel & Co. | I | Des Moines River | | TEMPORARILY CLOSED | | | Oxidation Ditch |
| Martin Marietta Corp. | I | Des Moines River | - | - | - | - | No Treatment |
| Eldon WTP | S | Chippewa Creek | - | 0.007 | - | - | No Treatment |
| Eldon | M | Des Moines River | - | 0.130 D | Controlled Discharge | Step 3 & 15 Month | - |
| Moravia | M | Soap Creek | - | 0.053 | Controlled Discharge | - | - |
| Sundown Lake Development | S | South Soap Creek | - | 0.049 | - | - | Lagoon |
| Blakesburg | M | Little Soap | - | - | Controlled Discharge | - | - |
| Floris | M | Soap Creek | - | - | - | - | No Treatment |
| Kaser Construction Co. | I | Unnamed Tributary | - | - | - | - | Quarry Dewatering |
| Douds Stone, Inc. | I | Des Moines River | - | 0.100 | - | - | Quarry Dewatering |

## DISCHARGE INVENTORY

## BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Douds Mine | I | Des Moines River | - | 0.180 | - | - | Quarry Dewatering |
| Libertyville | M | Lick Creek | $BOD_5$<br>$NH_3$ | 0.039 | 30 mg/1<br>15 mg/1 | - | - |
| Burchett Supper Club | I | Chequest | - | - | - | - | Lagoon |
| Douds Stone, Inc. (Lewis Quarry) |  | Chequest | - | 0.100 | - | - | Quarry Dewatering |
| Keosauqua |  | Des Moines River | - | 0.079 | Controlled Discharge | Step 3 & 15 Month | - |
| Keosauqua WTP | S | Unnamed Creek | - | - | - | - | No Treatment |
| Bonaparte | M | Des Moines River | - | - | Controlled Discharge | - | No Needs |
| Triangle Quarries | I | Big Indian Creek | - | - | - | - | Quarry Dewatering |
| Farmington | M | Des Moines River | - | - | Controlled Discharge | - | No Needs |
| Larmony Community High School | S | Des Moines River | - | 0.010 D | - | - | Lagoon |

## DISCHARGE INVENTORY

### BASIN - DES MOINES

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Donnellson | M | Sugar Creek | $BOD_5$<br>$NH_3$ | 0.078 | 10 mg/1<br>2 mg/1 | 6-1-79 | - |
| Sugar Valley Campground | S | Sugar Creek | - | - | - | - | Lagoon |
| Argyle School | S | Main Creek | - | - | - | - | Septic Tank |
| Central High School | S | Main Creek | - | - | - | - | Lagoon |

M = Municipal

I = Industrial

S = Semipublic

D = Design

E = Engineers Estimate

# SOUTHERN

# DISCHARGE INVENTORY

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Westphalia | M | Silver Creek | - | - | - | - | Septic tanks |
| Westphalia WTP | S | Silver Creek | - | 0.001 | - | - | Iron filter backwash |
| Schidberg Construction Company | I | Silver Creek | - | 2.03 | - | - | Quarry dewatering |
| Shelby | M | Middle Silver Creek | - | 0.063D | Controlled discharge | 12/1/78 | - |
| Treynor N.W. | M | Middle Silver Creek | - | 0.017 | Controlled discharge | Step 3 + 15 Months | - |
| Treynor S.E. | M | Middle Silver Creek | - | 0.013 | Controlled discharge | Step 3 + 15 Months | - |
| Silver City | M | Silver Creek | $BOD_5$<br>$NH_3$ | 0.035 | 30 mg/l<br>15 mg/l | - | - |
| Henningson Foods Inc. | I | Silver Creek | - | 0.108 | - | - | Lagoon |
| Malvern | M | Silver Creek | - | 0.434 | Controlled discharge | - | - |
| Kaser Construction Company | I | Silver Creek | - | 0.114 | - | - | Quarry dewatering |
| Aspinwall | M | Elk Creek | - | - | - | - | Septic tanks |

# DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| West Central Iowa Rural Water Association WTP | S | West Nishnabotna River | - | 0.005 | - | - | Iron and manganese filter backwash |
| Culligan Soft Water Service | I | West Nishnabotna River | - | 0.003 | - | - | No treatment |
| Manning | M | West Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.150 | 20 mg/1<br>10 mg/1 | Step 3 + 15 Months | - |
| Soypro International Inc. | I | West Nishnabotna River | - | - | - | - | Unknown |
| Irwin | M | West Nishnabotna River | - | 0.031 | Controlled discharge | Step 3 + 15 Months | - |
| Irwin WTP | S | West Nishnabotna River | - | - | - | - | No treatment |
| Manilla | M | West Fork West Nishnabotna River | - | 0.057 | Controlled discharge | - | - |
| Defiance | M | West Fork West Nishnabotna River | - | 0.031 | Controlled discharge | - | - |
| Kirkman | M | West Fork West Nishnabotna River | - | - | - | - | Septic tanks |
| Western Iowa Pork Company | I | West Fork West Nishnabotna River | - | - | - | - | Anaerobic, aerated and Aerobic |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Harlan WTP | S | West Fork West Nishnabotna River | - | - | - | - | No treatment |
| Harlan | M | West Fork West Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.632 | 14 mg/1<br>4 mg/1 | - | - |
| Shelby County Home | S | West Fork West Nishnabotna River | - | - | - | - | Septic tank |
| Avoca WTP | S | West Fork West Nishnabotna River | - | - | - | - | No treatment |
| Avoca | M | West Fork West Nishnabotna River | - | 0.143 | Controlled discharge | - | - |
| Gray | M | East Branch West Nishnabotna River | - | - | - | - | Septic tank |
| Prairie Rose State Park | S | East Branch West Nishnabotna River | - | - | - | - | 2 cell lagoon |
| Hancock | M | West Nishnabotna River | - | 0.007 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| American Beef Packers Inc. | I | West Nishnabotna River | - | 0.750 | - | - | Anaerobic, aerated, and aerobic lagoons |
| Oakland | M | West Nishnabotna River | - | 0.484 | Controlled discharge | Step 3 + 15 Months | - |
| Oakland Feeding Corporation | I | West Nishnabotna River | - | - | - | - | Runoff retention lagoons |
| Carson | M | West Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.119 | 30 mg/l<br>15 mg/l | Step 3 + 15 Months | - |
| Schildberg Construction Co. | I | West Nishnabotna River | - | - | - | - | Settling ponds |
| Medonia | M | West Nishnabotna River | - | 0.012 | Controlled discharge | 11/1/77 | - |
| Henderson | M | West Nishnabotna River | - | - | Controlled discharge | - | No needs |
| Northern Natural Gas Compressor Station | I | Jordan Creek | - | - | - | - | Septic tank |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Emerson | M | Indian Creek | $BOD_5$ | 0.036 | 30 mg/1 | 4/15/79 | - |
| American Natural Gas Company | I | Indian Creek | - | 0.010D | - | - | Activated sludge |
| Hastings | M | West Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.030 | 30 mg/1<br>15 mg/1 | - | - |
| Randolph | M | Deer Creek | $BOD_5$<br>$NH_3$ | 0.026 | 30 mg/1<br>15 mg/1 | - | - |
| Walnut WTP | S | Walnut Creek | - | - | - | - | No treatment |
| Colonial Motor Inn | S | Walnut Creek | - | 0.020D | - | - | Activated sludge |
| Walnut | M | Walnut Creek | - | 0.072 | Controlled discharge | Step 3 + 15 Months | - |
| Imogene | M | Hunter Branch | $BOD_5$<br>$NH_3$ | 0.024 | 30 mg/1<br>15 mg/1 | - | - |
| Imogene WTP | S | Hunter Branch | - | - | - | - | No treatment |
| Kimballton | M | Indian Creek | - | 0.040 | Controlled discharge | - | - |

# DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Elk Horn | M | Elkhorn Creek | - | 0.065 | Controlled discharge | Step 3 + 15 Months | - |
| Marne | M | Camp Creek | $BOD_5$<br>$NH_3$ | 0.019 | 30 mg/l<br>15 mg/l | - | - |
| Templeton | M | East Nishnabotna River | - | 0.020 | Controlled discharge | - | - |
| Audubon | M | Blue Grass Creek | - | 0.354 | - | - | - |
| Audubon County Home | S | Blue Grass Creek | - | - | - | - | Septic tanks |
| Exira | M | East Nishnabotna River | - | 0.068 | Controlled discharge | - | - |
| Exira WTP | S | Davids Creek | - | 0.050 | - | - | No treatment |
| Brayton | M | East Nishnabotna River | - | 0.014 | Controlled discharge | - | - |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Jack Huff Motel | S | East Nishnabotna River | - | 0.008 | - | - | Activated sludge |
| Skelley Oil Service Center | I | East Nishnabotna River | - | 0.005 | - | - | Lagoon |
| Manley Car and Truck Plaza | I | East Nishnabotna River | - | - | - | - | Lagoon |
| Phillips 66 Service Station and Restaurant | I | East Nishnabotna River | - | 0.001D | - | - | Lagoon |
| Atlantic | M | East Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.753 | 10 mg/l<br>4 mg/l | 9/1/79 | - |
| Atlantic-City Maintenance Building | S | East Nishnabotna River | - | 0.001D | - | - | Septic tank |
| Atlantic-WTP | S | Troublesome Creek | - | 0.003 | - | - | Holding pond |
| Abild M.H.P. | S | East Nishnabotna River | - | - | - | - | Lagoon |
| Allied Mills Inc. | I | East Nishnabotna River | - | 0.002D | - | - | Septic tank |
| Wise Owl Motel | I | East Nishnabotna River | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Schildberg Construction Company | I | East Nishnabotna River | - | 2.030 | - | - | Quarry dewatering |
| Stuckeys No. 244 | I | East Nishnabotna River | - | - | - | - | Septic tank |
| Cass County Home | S | East Nishnabotna River | - | - | - | - | Septic tank |
| Anita | M | Turkey Creek | - | 0.098 | Controlled discharge | Step 3 + 15 Months | - |
| Lake Anita State Park | S | Turkey Creek | - | - | - | - | Lagoon |
| Wiota | M | Turkey Creek | - | - | - | - | Septic tanks |
| Lewis | M | East Nishnabotna River | - | 0.061D | Controlled discharge | - | - |
| Schildberg Construction Company | I | East Nishnabotna River | - | 2.030 | - | - | Quarry dewatering |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Griswold | M | Baughmans Creek | $BOD_5$<br>$NH_3$ | 0.120 | 30 mg/1<br>15 mg/1 | Step 3 + 15 Months | - |
| Griswold WTP | S | Baughmans Creek | - | - | - | - | No treatment |
| Elliott | M | East Nishnabotna River | - | 0.056 | Controlled discharge | - | - |
| Red Oak | M | East Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.775 | 30 mg/1<br>15 mg/1 | Step 3 + 21 Months | - |
| Powell School | S | East Nishnabotna River | - | - | - | - | No treatment |
| Montgomery County Home | S | East Nishnabotna River | - | - | - | - | Septic tank |
| Uniroyal Inc. | I | East Nishnabotna River | - | - | - | - | Retention pond |
| Kaser Construction Company | I | East Nishanbotna River | - | 0.040 | - | - | Quarry dewatering |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Hallett Construction Company | I | East Nishnabotna River | - | - | - | - | Discharge discontinued |
| Coburg | M | East Nishnabotna River | - | - | - | - | Septic tanks |
| Essex | M | East Nishnabotna River | - | 0.190 | Controlled discharge | Step 3 + 15 Months | - |
| Shenandoah | M | East Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.575 | 30 mg/1<br>7 mg/1 | Step 3 + 15 Months | - |
| Farragut | M | East Nishnabotna River | - | 0.031 | Controlled discharge | Step 3 + 15 Months | - |
| Riverton | M | East Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.040 | 30 mg/1<br>15 mg/1 | - | - |
| Sidney | M | West Nishnabotna River | $BOD_5$<br>$NH_3$ | 0.054 | 30 mg/1<br>10 mg/1 | Step 3 + 15 Months | - |

# DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Fremont County Home | S | West Nishnabotna River | - | - | - | - | Septic tanks |
| Hamburg | M | Nishnabotna River | - | 0.115 | Controlled discharge | - | - |
| Northboro | M | North Tarkio Creek | - | - | - | - | Septic tanks |
| Stanton | M | Tarkio River | - | 0.046 | Controlled discharge | - | - |
| Stanton WTP | S | Tarkio River | - | - | - | - | No treatment |
| Yorktown | M | East Tarkio Creek | - | - | - | - | Septic tanks |
| Coin | M | Tarkio River | - | 0.033 | Controlled discharge | - | No needs |
| Blanchard | M | Tarkio River | - | - | - | - | Septic tanks |
| College Spings | M | Mill Creek | $BOD_5$<br>$NH_3$ | 0.033 | 30 mg/1<br>15 mg/1 | - | - |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Cumberland | M | Sevenmile Creek | $BOD_5$ | 0.039 | 30 mg/1 | - | - |
| Messena | M | West Nodaway River | $BOD_5$<br>$NH_3$ | 0.025 | 30 mg/1<br>15 mg/1/ | 11/1/79 | - |
| Grant | M | West Nodaway River | $BOD_5$<br>$NH_3$ | 0.026 | 30 mg/1<br>15 mg/1 | - | - |
| Kaser Construction Company | I | Sevenmile Creek | - | 0.250 | - | - | Quarry dewatering |
| Viking Lake State Park | S | West Nodaway River | - | - | - | - | Lagoon |
| Villisca Community School | S | Middle Nodaway River | - | - | - | - | No treatment |
| Camp Aldersgate United Methodist Camp | S | Middle Nodaway River | - | - | - | - | Lagoon |

# DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Villisca | M | Middle Nodaway River | $BOD_5$ | 0.189D | 30 mg/l | Step 3 + 15 Months | - |
| Fontanelle | M | Middle Nodaway River | - | 0.084 | Controlled discharge | - | - |
| Bridgewater | M | West Fork | $BOD_5$ | - | 30 mg/l | - | No needs |
| Schildberg Construction Company | I | Middle Nodaway River | - | 2.030 | - | - | Quarry dewatering |
| Carbon | M | Middle Nodaway River | - | - | - | - | Septic tanks |
| Hepburn | M | West Nodaway River | - | - | - | - | Septic tanks |
| Clarinda | M | West Nodaway River | $BOD_5$<br>$NH_3$ | 1.287 | 30 mg/l<br>5 mg/l | Step 3 + 15 Months | - |
| Clarinda WTP | S | West Nodaway River | - | - | - | - | No treatment |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Page County Home | S | West Nodaway River | - | - | - | - | Septic tank |
| Shambaugh | M | West Nodaway River | - | - | - | - | Septic tanks |
| Shambaugh WTP | S | West Nodaway River | - | - | - | - | No treatment |
| Prescott | M | East Nodaway River | - | - | Controlled discharge | - | - |
| Prescott WTP | S | East Nodaway River | - | 0.001 | - | - | No treatment |
| Adams County Home | S | East Nodaway River | - | 0.005D | - | - | Lagoon |
| Walter's Creek Recreation Area | S | East Nodaway River | - | 0.708 | - | - | 2 cell lagoon |
| Corning | M | East Nodaway River | $BOD_5$<br>$NH_3$ | 0.281 | 30 mg/1<br>8 mg/1 | Step 3 + 15 Months | - |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Schildberg Construction Company | I | East Nodaway River | - | 0.120 | - | - | Settling ponds |
| Nodaway | M | East Nodaway River | - | - | - | - | Septic tanks |
| Gendler Stone Products Company | I | Buchanan Creek | - | - | - | - | Settling ponds |
| Braddyville | M | Nodaway River | - | 0.028 | Controlled discharge | - | - |
| New Market | M | West Fork 102 River | - | 0.060D | Controlled discharge | - | - |
| Lenox | M | Middle Branch | - | 0.080 | Controlled discharge | - | - |
| Lenox WTP | S | Middle Branch | - | - | - | - | No treatment |
| Gravity | M | Middle Fork 102 River | $BOD_5$<br>$NH_3$ | 0.030 | 30 mg/l<br>15 mg/l | - | No needs |

## DISCHARGE INVENTORY

### BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Gendler Stone Products Company | I | Middle Fork | - | - | - | - | Settling ponds |
| Sharpsburg | M | East Fork 102 River | - | - | - | - | Septic tanks |
| Conway | M | East Fork 102 River | - | - | - | - | Septic tanks |
| Conway WTP | S | East Fork 102 River | - | 0.002 | - | - | No treatment |
| Bedford | M | East Fork 102 River | $BOD_5$ | 0.179 | 30 mg/1 | Step 3 + 15 Months | - |
| Bedford WTP | S | East Fork 102 River | - | 0.0007 | - | - | No treatment |
| Bedford County Club | S | East Fork 102 River | - | - | - | - | Lagoon |
| Taylor County Home | S | East Fork 102 River | - | - | - | - | Septic tank |
| Gendler Stone Products | I | East Fork 102 River | - | 0.100 | - | - | Settling ponds |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Creston | M | West Platte River | $BOD_5$<br>$NH_3$ | 1.474 | 10 mg/1<br>2 mg/1 | Step 3 + 15 Months | - |
| Creston WTP | S | West Platte River | - | - | - | - | No treatment filter backwash |
| Green Valley State Park | S | West Platte River | - | - | - | - | Lagoon |
| Union County Home | S | West Platte River | - | - | - | - | Septic tanks |
| Cromwell | M | West Platte River | - | - | - | - | Septic tanks |
| Kent | M | West Platte River | - | - | - | - | Septic tanks |
| Clearfield | M | Platte River | $BOD_5$<br>$NH_3$ | 0.041 | 30 mg/1<br>15 mg/1 | - | - |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Ringgold County Home | S | Walnut Creek | - | - | - | - | No treatment |
| Armour and Company | I | Walnut Creek | - | - | - | - | No treatment |
| Mount Ayr Fish Hatchery | S | Walnut Creek | - | - | - | - | No treatment |
| Mount Ayr | M | Middle Fork Grand River | $BOD_5$ | 0.200 | 30 mg/1 | Step 3 + 15 Months | - |
| Mount Ayr WTP | S | Middle Fork Grand River | - | - | - | - | No treatment |
| Tingley | M | East Fork Grand River | $BOD_5$<br>$NH_3$ | 0.024 | 30 mg/1<br>15 mg/1 | - | - |
| Ellston | M | East Fork Grand River | - | - | - | - | Septic tanks |
| Kellerton | M | Lotts Creek | - | 0.029 | Controlled discharge | - | No needs |

## DISCHARGE INVENTORY

### BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Clearfield WTP | S | Platte River | - | - | - | - | Evaporation pond |
| Maloy | M | Platte River | - | - | - | - | Septic tanks |
| Blockton | M | Platte River | $BOD_5$<br>$NH_3$ | 0.026 | 30 mg/1<br>15 mg/1 | - | No needs |
| Athelstan | M | Platte River | - | - | - | - | Septic tanks |
| Arispe | M | Grand River | - | - | - | - | Septic tanks |
| Shannon City | M | Grand River | - | - | - | - | Septic tanks |
| Diagonal | M | Grand River | $BOD_5$<br>$NH_3$ | 0.032 | 30 mg/1<br>15 mg/1 | - | - |
| Benton | M | Grand River | - | - | - | - | Septic tanks |
| Delphos | M | Grand River | - | - | - | - | Septic tanks |
| Redding | M | Grand River | - | - | - | - | Septic tanks |

DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Greenfield | M | Thompson River | $BOD_5$<br>$NH_3$ | 0.430 | 10 mg/1<br>2 mg/1 | Step 3 +<br>15 Months | - |
| Adair County Home | S | Thompson River | - | - | - | - | Septic tank |
| Greenfield WTP | S | Marvel Creek | - | - | - | - | Iron and mangnese backwash |
| Macksburg | M | Thompson Creek | - | - | - | - | Septic tanks |
| Orient | M | Threemile Creek | $BOD_5$<br>$NH_3$ | 0.032 | 30 mg/1<br>15 mg/1 | - | - |
| Schildberg Construction Company | I | Threemile Creek | - | 2.030 | - | - | Quarry dewatering |
| Lorimor | M | Fourmile Creek | $BOD_5$<br>$NH_3$ | 0.036 | 30 mg/1<br>13 mg/1 | - | - |
| Thayer | M | Fourmile Creek | - | - | - | - | Septic tanks |
| Afton | M | Twelvemile Creek | - | 0.060 | Controlled discharge | - | - |

# DISCHARGE INVENTORY

**BASIN -** Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Green Valley Chemical Corp. | I | Twelvemile Creek | BOD<br>$NH_3$ | 0.150 | 30 mg/1<br>3 mg/1 | - | Lagoon |
| E.I. Sargent Quarries Inc. | I | Thompson River | - | 0.002 | - | - | Settling ponds |
| Grand River | M | Thompson River | - | - | - | - | Septic tanks |
| Murray | M | East Long Creek | $BOD_5$<br>$NH_3$ | 0.076 | 30 mg/1<br>15 mg/1 | - | - |
| E.I. Sargent Quarries Inc. | I | Short Creek | - | - | - | - | No treatment |
| Decatur City | M | Thompson River | - | - | - | - | Septic tanks |
| LeRoy's Skelley Service Station and Restaurant | I | Thompson River | - | - | - | - | 2 cell lagoon |
| E.I. Sargent Quarries Inc. | I | Thompson River | - | 0.003 | - | - | Settling ponds |
| Beaconsfield | M | Elk Creek | - | - | - | - | Septic tanks |

## DISCHARGE INVENTORY

### BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Martin Marietta Corporation | I | Patterhoff Creek | - | 0.100 | - | - | No treatment |
| Davis City | M | Thompson River | $BOD_5$ | 0.025 | 30 mg/l | - | - |
| Lamoni | M | Thompson River | - | 0.301 | Controlled discharge | 11/1/79 | - |
| Barth Supper Club | S | Thompson River | - | - | - | - | Lagoon |
| Farmsong M.H.P. | S | Thompson River | - | - | - | - | Lagoon |
| Leighton Development | S | Thompson River | - | - | - | - | Lagoon |
| Iowa Dept. of Transportation Rest Area I-35 East Side No. 034R | S | Thompson River | - | 0.002 | - | - | 2 cell lagoon |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Standard Oil Service Station Restaurant and Motel | I | Thompson River | - | 0.007 D | - | - | 2 cell lagoon |
| Nine Eagles State Park | S | Thompson River | - | - | - | - | 2 cell lagoon |
| Pleasanton | M | Thompson River | - | - | - | - | Septic tanks |
| Van Wert | M | Little River | $BOD_5$<br>$NH_3$ | 0.020 | 30 mg/1<br>15 mg/1 | - | - |
| Leon | M | McGruder Creek | $BOD_5$ | 0.187 | 30 mg/1 | 7/1/78 | - |
| Leon WTP | S | McGruder Creek | - | - | - | - | No treatment |
| Decatur County Home | S | McGruder Creek | - | - | - | - | Septic tank |
| Weldon | M | Weldon River | $BOD_5$<br>$NH_3$ | 0.016 | 10 mg/1<br>2 mg/1 | - | |
| LeRoy | M | Weldon River | - | - | - | - | Septic tanks |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Garden Grove | M | Weldon River | $BOD_5$<br>$NH_3$ | 0.024 | 30 mg/1<br>15 mg/1 | - | - |
| Clio | M | Little Muddy Creek | - | - | - | - | Septic tanks |
| Lineville | M | Little Muddy Creek | $BOD_5$<br>$NH_3$ | 0.036 | 30 mg/1<br>15 mg/1 | - | - |
| Lineville WTP | S | Little Muddy Creek | - | - | - | - | No treatment |
| Allerton | M | Middie Fork Medicine Creek | - | 0.015 | Controlled discharge | - | - |
| Cincinnati | M | North Creek | $BOD_5$<br>$NH_3$ | 0.066 | 30 mg/1<br>15 mg/1 | - | - |
| Seymour S.W. and E. | M | Shoal Creek | $BOD_5$ | - | 30 mg/1 | 4/1/80 | - |
| Seymour WTP | S | Shoal Creek | - | 0.072 | - | - | Settling Basin |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Numa | M | Shoal Creek | - | - | - | - | Septic tanks |
| Exline | M | Shoal Creek | $BOD_5$<br>$NH_3$ | 0.026 | 30 mg/l<br>15 mg/l | - | - |
| Derby | M | Chariton River | - | - | - | - | Septic tanks |
| Chariton | M | Chariton River | $BOD_5$<br>$NH_3$ | 0.621 | 10 mg/l<br>2 mg/l | Step 3 + 21 Months | - |
| Blue Grass Inn | S | Chariton River | - | - | - | - | Septic tank |
| Lucas County Home | S | Chariton River | - | - | - | - | Septic tank |
| Russell | M | Honey Creek | - | 0.048 | Controlled discharge | Step 3 + 15 Months | - |
| Russell WTP | S | Honey Creek | - | - | - | - | No treatment |
| Indian Ridge M.H.P. | S | Rathbun Lake | - | 0.011D | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Heavenly Hide Away | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Bridge View Public Use Area WTP | S | Rathbun Lake | - | - | - | - | No treatment |
| Bridge View Public Use Area STP | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Millerton | M | Wolf Creek | - | - | - | - | Septic tanks |
| Humeston | M | Ninemile Creek | - | 0.055 | Controlled discharge | Step 3 + 15 Months | - |
| Corydon N.E. | M | Wildcat Creek | - | 0.060 | Controlled discharge | Step 3 + 15 Months | - |
| Corydon S.E. | M | West Jackson Creek | - | 0.025 | Controlled discharge | Step 3 + 15 Months | - |
| Corydon S.W. | M | West Jackson Creek | - | 0.025 | Controlled discharge | Step 3 + 15 Months | - |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Corydon S. | M | West Jackson Creek | - | 0.060 | Controlled discharge | Step 3 + 15 Months | - |
| Wayne County Home | S | West Jackson Creek | - | - | - | - | Lagoon |
| Allerton WTP | S | West Jackson Creek | - | - | - | - | No treatment |
| Corydon WTP | S | West Jackson Creek | - | - | - | - | No treatment |
| Ridgeview East Subdivision | S | Snider Branch | - | - | - | - | 2 cell lagoon |
| Floyd Dixon's Lazy Daz | S | Rathbun Lake | - | - | - | - | Lagoon |
| South Fork Public Use Area STP | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| South Fork Public Use Area WTP | S | Rathbun Lake | - | - | - | - | No treatment |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Rolling Cove Public Use Area WTP | S | Rathbun Lake | - | - | - | - | No treatment |
| Island View Public Use Area West STP | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Island View Public Use Area WTP | S | Rathbun Lake | - | - | - | - | No treatment |
| Island View Public Use Area East STP | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Administration Area STP | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Administration Area WTP | S | Rathbun Lake | - | - | - | - | No treatment |
| A. E. Butler Campground | S | Rathbun Lake | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Antler Acres Parkside Knolls Subdivision | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Lake Rathbun KOA Campground | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Buck Creek Developement | S | Rathbun Lake | - | - | - | - | Lagoon |
| Buck Creek Public Use Area East | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Buck Creek Public Use Area WTP | S | Rathbun Lake | - | - | - | - | No treatment |
| Buck Creek Public Use Area West | S | Rathbun Lake | - | - | - | - | 2 cell lagoon |
| Rathbun | M | Chariton River | - | - | - | - | Septic tanks |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Plano | M | Little Walnut Creek | - | - | - | - | Septic tanks |
| Rathbun Fish Hatchery | S | Chariton River | - | 8.000 | - | - | Lagoons |
| Promise City | M | Walnut Creek | - | - | - | - | Septic tanks |
| Mystic | M | Walnut Creek | $BOD_5$<br>$NH_3$ | 0.081 | 30 mg/1<br>15 mg/1 | - | - |
| Mystic Primary School | S | Walnut Creek | - | 0.001 | - | - | Lagoon |
| Appanoose County Home | S | Cooper Creek | - | - | - | - | No treatment |
| Centerville N.E. | M | Cooper Creek | $BOD_5$<br>$NH_3$ | 0.783 | 30 mg/1<br>9 mg/1 | 7/1/78 | - |
| Centerville W. | M | Cooper Creek | $BOD_5$ | 0.291 | 30 mg/1 | 7/1/78 | - |

# DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Rathbun Regional Water Association WTP | S | Cooper Creek | - | - | - | - | 2 cell lagoon |
| Rathbun Heights Development | S | Cooper Creek | - | - | - | - | 2 cell lagoon |
| Centerville WTD | S | Cooper Creek | - | - | - | - | No treatment |
| Carter-Waters Corp. | I | Cooper Creek | - | - | - | - | Settling ponds |
| Udell | M | Fox River | - | - | - | - | Septic tanks |
| Oaks Campground | S | Fox River | - | - | - | - | 2 cell lagoon |
| Moulton | M | Fox River | - | 0.074 | Controlled discharge | - | - |
| Drakesville | M | Fox River | - | - | - | - | Septic tanks |
| Bloomfield | M | Fox River | $BOD_5$ | 0.284 | 30 mg/1 | 12/1/78 | - |
| Rupe Campgrounds | S | Fox River | - | - | - | - | Septic tank |

## DISCHARGE INVENTORY

BASIN - Southern

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| MBZ M.H.P. | S | Fox River | - | - | - | - | Lagoon |
| Davis County Home | S | Fox River | - | - | - | - | No treatment |
| Pulaski | M | Fox River | $BOD_5$<br>$NH_3$ | 0.028 | 30 mg/1<br>15 mg/1 | - | - |
| Milton | M | Little Fox River | - | 0.082D | Controlled discharge | - | - |
| Cantril | M | Little Fox River | - | 0.045 | Controlled discharge | - | - |
| Mt. Sterling | M | Fox River | - | - | - | - | Septic tanks |

D = Design

E = Engineers Estimate

M = Municipal

I = Industrial

S = Semipublic

# WESTERN
# DISCHARGE INVENTORY

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Larchwood | M | Bloody Run Creek | - | 0.72D | Controlled Discharge | Step 3 & 15 Month | - |
| Inwood | M | Unnamed Tributary | - | 0.76E | Controlled Discharge | Step 3 & 15 Month | - |
| West Lyon Community School District, Inwood | S | Unnamed Tributary | - | - | - | - | - |
| Rock Rapids | M | Rock River | $BOD_5$<br>$NH_3$ | 0.181 | 10 mg/1<br>2 mg/1 | 8-1-79 | - |
| Lyon County Home | S | Rock River | - | - | - | - | No Treatment |
| Lester | M | Mud Creek | - | 0.028 | Controlled Discharge | Step 3 & 15 Month | - |
| Alvord | M | Mud Creek | - | 0.016 | Controlled Discharge | Step 3 & 15 Month | - |
| Little Rock | M | Little Rock River | $BOD_5$<br>$NH_3$ | 0.04D | 10 mg/1<br>4 mg/1 | Step 3 & 15 Month | - |
| George | M | Little Rock River | - | 0.071 | Controlled Discharge | - | - |
| Sibley STP | M | Otto Creek | $BOD_5$<br>$NH_3$ | 0.356 | 10 mg/1<br>2 mg/1 | 12-31-79 | -<br>- |
| Sibley WTP | S | Otto Creek | - | - | - | - | Filter Backwash to Storm Sewer |

# DISCHARGE INVENTORY

## BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Sibley Municipal Utility | S | Otter Creek | - | 0.020D | - | - | Cooling Tower Bleed Water to Storm Sewer |
| Ashton | M | Otter Creek | - | 0.031 | Controlled Discharge | - | No Needs |
| Hallett Construction Company, Ashton | I | Otter Creek | - | 1.50D | - | - | Sand and Gravel Wash Water |
| Matlock | M | Otter Creek | - | - | - | - | No Treatment |
| Doon | M | Little Rock River | - | 0.044 | Controlled Discharge | - | - |
| Hull STP | M | Burr Oak Creek | $BOD_5$<br>$NH_3$ | 0.108 | 12 mg/l<br>4 mg/l | Step 3 & 15 Month | - |
| Hull WTP | S | Burr Oak Creek | - | - | - | - | Backwash Water to Storm Sewer |
| Rock Valley | M | Rock River | $BOD_5$<br>$NH_3$ | 0.113 | 10 mg/l<br>2 mg/l | 7-1-79 | - |
| Kooima Machine Works, Rock Valley | I | Rock River | - | - | - | - | No Treatment |
| Lake Pahoja Recreation Area | S | Rock River | - | 0.008D | - | - | Septic Tanks |
| Hawarden | M | Dry Creek | $BOD_5$<br>$NH_3$ | 0.168 | 30 mg/l<br>15 mg/l | 9-1-77 | - |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Chatsworth | M | Six Mile Creek | - | - | - | - | Septic Tanks |
| Ireton STP | M | Spring Creek | $BOD_5$ | 0.040 | 30 mg/1 | Step 3 & 15 Month | - |
| Ireton WTP | S | Spring Creek | - | - | - | - | - |
| Akron | M | Big Sioux River | $BOD_5$<br>$NH_3$ | 0.144 | 30 mg/1<br>15 mg/1 | - | No Needs |
| Westfield | M | Big Sioux River | - | 0.028 | Controlled Discharge | - | - |
| Melvin | M | Floyd River | - | 0.034 | Controlled Discharge | - | - |
| Sheldon | M | Floyd River | $BOD_5$<br>$NH_3$ | 0.217 | 15 mg/1<br>4 mg/1 | 12-1-78 | - |
| Land O'Lakes, Sheldon | I | Floyd River | - | - | - | - | All Wastes to Sewage Treatment Plant |
| Sanborn | M | Little Floyd River | $BOD_5$<br>$NH_3$ | 0.170 | 15 mg/1<br>4 mg/1 | 12-1-78 | - |
| Hospers | M | Floyd River | - | 0.065 | Controlled Discharge | 9-1-77 | - |
| Hospers Rural Water System #1 | S | Floyd River | - | 0.006 | - | - | Lagoon |
| Alton | M | Floyd River | - | 0.153 | Controlled Discharge | Step 3 & 15 Month | - |

DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Orange City STP | M | Unnamed Tributary | $BOD_5$<br>$NH_3$ | 0.516E | 10 mg/1<br>2 mg/1 | 1-1-80 | - |
| Orange City WTP | S | Unnamed Tributary | - | 0.025 | - | - | Backwash to Storm Sewer |
| Sioux County Home, Orange City | S | Unnamed Tributary | - | - | - | - | - |
| Granville STP | M | Willow Creek | - | 0.038E | Controlled Discharge | - | - |
| Granville WTP | S | Willow Creek | - | - | - | - | Backwash to Municipal STP |
| Remsen | M | Deep Creek | $BOD_5$<br>$NH_3$ | 0.090 | 15 mg/1<br>4 mg/1 | 1-1-80 | - |
| Oyens | M | Deep Creek | - | 0.015E | Controlled Discharge | 12-1-78 | - |
| LeMars | M | Floyd River | $BOD_5$<br>$NH_3$ | 0.810 | 10 mg/1<br>2 mg/1 | 5-1-80 | - |
| Athens Conoco Car Wash, LeMars | I | Floyd River | - | - | - | - | May be Connected to STP |
| Dubuque Packing Company, LeMars | I | Floyd River | - | - | - | - | No Discharge, Lagoons |
| Plymouth County Home, LeMars | S | Floyd River | - | - | - | - | Unknown |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Boyden | M | West Branch Floyd River | $BOD_5$<br>$NH_3$ | 0.058 | 15 mg/1<br>4 mg/1 | 4-1-80 | - |
| Sioux Center STP | M | Unnamed Tributary | $BOD_5$<br>$NH_3$ | 0.398 | 20 mg/1<br>5 mg/1 | 11-1-78 | - |
| Sioux Center WTD | S | Unnamed | - | - | - | - | All Discharges to STP |
| Sioux Center Preme Packing Co., Sioux Center | I | Unnamed Tributary | - | 0.575 | - | - | 4 Lagoons and Spray Irrigation |
| Hyman's Construction, Co.,Sioux Center | I | Unnamed Tributary | - | 1.50D | - | - | Quarry Water |
| Maurice | M | West Branch Floyd River | $BOD_5$<br>$NH_3$ | 0.0266 | 20 mg/1<br>5 mg/1 | 3-1-80 | - |
| Struble | M | West Branch Floyd River | - | - | - | - | Septic Tanks |
| Craig | M | Mink Creek | - | - | - | - | Septic Tanks |
| Burnsville | M | Mink Creek | - | 0.013E | Controlled Discharge | Step 3 & 15 Month | - |
| Merrill | M | West Branch Floyd River | - | 0.080E | Controlled Discharge | - | - |
| Hinton | M | West Branch Floyd River | - | 0.043 | Controlled Discharge | 12-1-78 | - |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Sioux City | M | Missouri River | $BOD_5$ | 16.81 | 30 mg/1 | 6-1-78 | - |
| Sergeant Bluff | M | Missouri River | - | - | - | - | To Sioux City STP |
| Sioux City Stock Yards, Sioux City | I | Missouri | - | - | - | - | To Municipal STP |
| Flavorland Beef Division, Sioux City | I | Abandoned Floyd River Channel | - | 001 = 0.460<br>002 =<br>003 = | - | - | 001 = Cooling Water<br>002 = To Municipal STP<br>003 = To Municipal STP |
| Sioux City Cold Storage Co. | I | Abandoned River Channel | - | 0.080 | - | - | To Municipal STP |
| Stockyards Service and Supply Co., Sioux City | I | Missouri River | - | 0.050 | - | - | To Municipal STP<br>Boiler blowdown & softener backwash to Mo. R. |
| Armour & Co., Sioux City | | Missouri River | - | 001 =<br>002 = 0.170<br>003 = 0.864 | - | - | 001 = To Municipal STP<br>002 = Cooling Water<br>003 = Cooling Water |
| Cargill, Inc., Sioux City | | Missouri River | - | - | - | - | To Municipal STP |
| Chesterman Co., Sioux City | I | Missouri River | - | - | - | - | To Municipal STP |

DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Iowa Public Service Co., Sioux City | I | Missouri River | - | - | - | - | Cooling Water |
| Iowa Public Service Co., Sioux City | I | Missouri River | - | - | - | - | Cooling Water |
| Johnson Biscuit Co., Sioux City | I | Floyd River | - | 0.500 | - | - | Cooling Water |
| Mid-State Packers Inc., Sioux City | I | Abandoned Floyd River Channel | - | 001 = 0.550<br>002 = 0.080<br>003 = 0.190 | -<br>- | -<br>- | 001 = Cooling Water<br>002 = Cooling Water<br>003 = To Municipal STP |
| Nutra-Flow Chemical Co., Sioux City | I | Missouri River | - | 001 = 0.864<br>002 = 0.864 | - | - | 001 To Mo. R.<br>002 To Floyd River<br>Cooling Water |
| Raskin Packing Co., Inc., Sioux City | I | Abandoned Floyd | - | 0.300 | - | - | Cooling Water |
| Roberts Dairy Co., Sioux City | I | Perry Creek | - | 0.250 | - | - | Cooling Water |
| Swift & Co., Sioux City | I | Perry Creek | - | - | - | - | - |
| Swift Dairy & Poultry Co., Sioux City | I | Perry Creek | - | - | - | - | - |

DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Standard Ready Mix Co., Sioux City | I | Floyd River Drainage Ditch | -<br>- | 0.020<br>0.040 | -<br>- | -<br>- | Settling Basins<br>To Municipal STP |
| United Packing of Iowa, Sioux City | I | Abandoned Floyd River Channel | - | 0.070 | - | - | Cooling Water |
| Sioux Tools Inc., Sioux City | I | Floyd River | - | 001 = 0.035<br>002 = 0.035 | - | - | 001 = Cooling Water<br>002 = Cooling Water |
| Hilton Inn Sioux City | I | Missouri River | - | 0.050 | - | - | Cooling Water |
| Toy National Bank Sioux City | I | Missouri River | - | 0.050 | - | - | Cooling Water |
| Northwestern Bell Telephone Co., Sioux City | I | Missouri River | - | 0.050 | - | - | Cooling Water |
| Myer Beef Inc. Sioux City | I | Missouri River | - | - | - | - | Municipal Wastes to STP - Cooling Water |
| Gates Rubber Co., Sioux City | I | Missouri River | - | - | - | - | To Municipal STP |
| St. Regis Paper Co., Wheeler Div., Sioux City | I | Missouri River | - | - | - | - | - |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Roe Dairy Co. Sioux City | I | Missouri River | - | - | - | - | To Municipal STP |
| Soft Water Service Inc., Sioux City | I | Perry Creek | - | 0.016 | - | - | To Municipal STP |
| Steele's Ice Service, Sioux City | I | Perry Creek | - | 0.006 | - | - | To Municipal STP - Cooling Water to Storm Sewer |
| Chicago and Northwestern RR, Sioux City | I | Floyd River | - | 001 = 0.020 | - | - | Septic Tank |
| Chicago, Milwau kee, St.Paul & Pacific R.R., Sioux City | I | Big Sioux River | - | 0.001 | - | - | Waste Water From Engine House |
| Martin Apartment Building, Sioux City | I | Missouri River | - | 0.540 | - | - | Cooling Water |
| Flavorland (Hide Processing Div.) | I | New Lake Unnamed | - | 0.239 | 100 lbs. $BOD_5$<br>50 lbs. $NH_3$N | - | Aerated Lagoons with a Polishing Pond |
| Kind & Knox Gelatin, Sioux City | I | Oxbow | - | 1.1 | 275 lbs. $BOD_5$ | - | Three Cell Lagoon |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Iowa Public Service Co., Sioux City | I | Missouri River | - | 627 | - | - | Cooling Water |
| Iowa Public Service Co., Sioux City | I | Missouri River | - | 475 | - | - | Cooling Water |
| Terra Chemicals Sioux City | I | Missouri River | $NH_3N$ | 1.02 | 185 lbs. | - | 2 Lagoons |
| International Inc., Sioux City | I | Missouri River | - | - | - | - | - |
| Farmland Ind. Soybean Extraction Plant, Sioux City | I | Missouri River | $BOD_5$ | 001 = 0.050<br>002 = 4.00 | 15 lbs. | - | 001 = Extented Areation<br>002 = Cooling Water |
| Iowa Hwy. Comm. Rest Area #016R, Sergeant Bluffs | S | Missouri | - | 0.004 | - | - | Lagoon |
| Sloan | M | Boyer Drainage Ditch #1 | $BOD_5$ | 0.078 | 30 mg/1 | Step 3 & 15 Month | - |
| Whiting | M | Cleghorn Ditch | - | 0.051 | Controlled Discharge | - | - |
| Agricultural Co. Business, Inc., Whiting | I | Cleghorn Ditch | - | 0.033 | - | - | Cooling Water |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Interchange Service Corp., Whiting | I | Cleghorn Ditch | - | 0.008D | - | - | Extended Areation |
| Louis & Clark State Park, State Conservation Comm. | S | Cleghorn Ditch | - | - | - | - | Two Cell Lagoon |
| Salix | M | Farmers Ditch | - | 0.043E | Controlled Discharge | - | No Needs |
| Onawa | M | McNeil Ditch | $BOD_5$ | 0.449 | 30 mg/1 | 7-1-79 | - |
| Blencoe | M | McNeil Ditch | - | 0.023E | Controlled Discharge | Step 3 & 15 Month | - |
| Dwights Skelly, Blencoe | I | McNeil Ditch | - | - | - | - | Lagoon |
| Lake Park | M | Silver Lake | - | 0.045 | Controlled Discharge | Step 3 & 15 Month | - |
| Orleans | M | Spirit Lake | - | - | - | - | To Iowa Great Lakes Sanitary District |
| Iowa Electric Light & Power | S | Spirit Lake | - | - | - | - | To Iowa Great Lakes Sanitary District |
| Spirit Lake | M | East Okoboji Lake | - | - | - | - | To Iowa Great Lakes Sanitary District |

## DISCHARGE INVENTORY

## BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Spirit Lake Fish Hatchery | I | East Okoboji Lake | - | - | - | - | To Iowa Great Lakes Sanitary District |
| Okoboji | M | West Okoboji Lake | - | - | - | - | To Iowa Great Lakes Sanitary District |
| Arnold's Park | M | West Okoboji Lake | - | - | - | - | To Iowa Great Lakes District |
| Wahpeton | M | West Okoboji Lake | - | - | - | - | To Iowa Great Lakes Sanitary District |
| West Okoboji | M | West Okoboji Lake | - | - | - | - | To Iowa Great Lakes Sanitary District |
| Iowa Great Lakes Sanitary District | S | Okoboji Lake Outlet | $BOD_5$<br>$NH_3$ | 1.88 | 10 mg/1<br>2 mg/1 | 9-1-78 | - |
| Iowa Great Lakes Water Treatment Plant | S | Okoboji Lake Outlet | - | - | - | - | To Iowa Great Lakes Sanitary District |
| Milford | M | Okoboji Lake Outlet | - | - | - | - | To Iowa Great Lakes Sanitary District |
| Ocheyedan | M | Rush Lake Outlet | - | 0.039 | Controlled Discharge | | No Needs |
| Harris | M | Dry Run | - | 0.016 | Controlled Discharge | - | No Needs |
| Hartley | M | Sewer Creek | $BOD_5$<br>$NH_3$ | 0.205 | 10 mg/1<br>5 mg/1 | Step 3 & 15 Month | - |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Hartley WTP | S | Sewer Creek | - | 0.0005 | - | - | No Treatment |
| Hartley Grain Elevators | I | Sewer Creek | - | - | - | - | Septic Tank |
| Everly | M | Ocheyedan River | - | 0.076 | Controlled Discharge | - | - |
| Everly WTP | S | Ocheyedan River | - | - | - | - | - |
| Royal | M | Prairie Creek | - | 0.048 | Controlled Discharge | - | - |
| Royal WTP | S | Prairie Creek | - | - | - | - | No Treatment |
| Cornbelt Power Co-op, Spencer | I | Ocheyedan River | - | - | - | - | Septic Tanks |
| Spencer STP | M | Little Sioux River | $BOD_5$<br>$NH_3$ | 1.87 | 10 mg/1<br>2 mg/1 | - | No Needs |
| Spencer Rendering Company | I | Little Sioux River | - | 0.025D | - | - | To Municipal STP |
| Eaton Corp., Spencer | I | Little Sioux River | - | 0.016D | - | - | Lagoons |
| Spencer Municipal Power Plant | I | Little Sioux River | - | - | - | - | - |

DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Superior | M | Big Muddy Creek | - | - | - | - | No Treatment |
| Fostoria | M | Little Muddy Creek | - | 0.033 | Controlled Discharge | - | No Needs |
| Terrill | M | Drainage Ditch # 61 C | - | 0.032 | Controlled Discharge | - | - |
| Dickens | M | Lost Island Lake Outlet | - | 0.024 | Controlled Discharge | - | - |
| Ruthven STP | M | Drainage Ditch # 60 | - | 0.053 | Controlled Discharge | Step 3 & 15 Month | - |
| Webb | M | Montgomery Creek | - | 0.023 | Controlled Discharge | - | - |
| Moneta | M | Willow Creek | - | - | - | - | No Treatment |
| Rossie | M | Willow Creek | - | - | - | - | No Treatment |
| Greenville | M | Willow Creek | - | - | - | - | No Treatment |
| Sioux Rapids | M | Little Sioux River | $BOD_5$<br>$NH_3$ | 0.081 E | 30 mg/1<br>15 mg/1 | Step 3 & 15 Month | - |
| Linn Grove | M | Little Sioux River | - | 0.022 | Controlled Discharge | Step 3 & 15 Month | - |
| Linn Grove Rendering | I | Little Sioux River | - | 001 = 0.018<br>002 = 0.001 | - | - | 001 = Untreated Process Water<br>002 = Boiler Blowdown |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Peterson | M | Little Soux River | - | 0.047 E | Controlled Discharge | - | No Needs |
| Sutherland | M | Waterman Creek | - | 0.096 E | Controlled Discharge | - | - |
| Primghar STP | M | Dry Run | - | 0.088 | Controlled Discharge | - | No Needs |
| Primghar WTP | S | Dry Run | - | 0.090 | - | - | - |
| Archer | M | Mill Creek | - | - | - | - | Septic Tanks |
| Paullina | M | Mill Creek | - | 0.117 | Controlled Discharge | - | No Needs |
| Calumet | M | Mugge Creek | - | 0.023 | Controlled Discharge | - | No Needs |
| Larrabee | M | Gray Creek | - | 0.018 E | Controlled Discharge | Step 3 & 15 Month | - |
| Meriden STP | M | Hill Creek | - | 0.015 | Controlled Discharge | 2-1-80 | - |
| Meridan WTP | S | Hill Creek | - | - | - | - | Iron Backwash Water To Municipal STP |
| Cherokee | M | Little Sioux River | $BOD_5$<br>$NH_3$ | 0.650 | 19 mg/1<br>19 mg/1 | 7-1-79 | - |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Hallet Construction Company Cherokee | I | Little Sioux River | - | 1.5 | - | - | Settling Basins |
| Cherokee Ind. Site (Wilson Pkg. Plant) | I | Little Sioux River | - | 0.699 | - | - | Combination Anaerobic Aerobic Lagoons |
| Cherokee County Home | S | Little Sioux | - | - | - | - | Septic Tanks |
| Cherokee Rural Water District #1 | S | Little Sioux River | - | 0.005 | - | - | Iron Filter Backwash Water |
| Meadow Brook Mobile Home Court | S | Railroad Creek | - | - | - | - | 1 Cell Lagoon |
| Cherokee Mental Health Clinic | S | Little Sioux River | - | 0.150 | - | - | To City STP |
| Quimby | M | Little Sioux River | - | 0.042 | Controlled Discharge | 10-1-77 | - |
| Simonsen Mill and Rendering Plant, Inc. Quimby | I | Little Sioux River | - | - | - | - | Lagoon |
| Cleghorn | M | Willow Creek | - | 0.030 E | Controlled Discharge | Step 3 & 15 Month | - |

## DISCHARGE INVENTORY

### BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Washta | M | Little Sioux River | - | 0.017 | Controlled Discharge | Step 3 & 15 Month | - |
| Pierson | M | Pierson Creek | - | 0.047 E | Controlled Discharge | - | - |
| Cushing | M | Bacon Creek | - | 0.026 | Controlled Discharge | 2-1-79 | - |
| Correctionville | M | Bacon Creek | $BOD_5$ | 0.118 | 30 mg/1 | Step 3 & 15 Month | - |
| Anthon | M | Little Sioux River | $BOD_5$ | 0.081 | 30 mg/1 | Step 3 & 15 Month | - |
| Oto | M | Little Sioux River | - | 0.023 | Controlled Discharge | - | - |
| Smithland | M | Smokey Hallow Creek | - | 0.033 E | Controlled Discharge | - | - |
| Rodney | M | Little Sioux River | - | - | - | - | No Treatment |
| Marcus STP | M | Fiddle Creek | $BOD_5$<br>$NH_3$ | 0.113 | 23 mg/1<br>6 mg/1 | 10-1-79 | - |
| Kingsley | M | West Fork Little Sioux River | - | 0.130 | Controlled Discharge | Step 3 & 15 Month | - |
| Moville | M | West Fork Little Sioux River | - | 0.160 E | Controlled Discharge | Step 3 & 15 Month | - |

DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Hornick STP | M | West Fork Little Sioux River | - | 0.028 | Controlled Discharge | 12-1-79 | - |
| Hornick WTP | S | West Fork Little Sioux River | - | 0.030 | - | - | All Wastes to Municipal STP |
| Lawton | M | Elliott Creek | - | 0.046 E | Controlled Discharge | Step 3 & 15 Month | - |
| Bronson | M | Elliot Creek | - | 0.022 E | Controlled Discharge | - | - |
| Aurelia STP | M | Dry Creek Bed | $BOD_5$<br>$NH_3$ | 0.091 | 10 mg/1<br>2 mg/1 | Step 3 & 15 Month | - |
| Pampered Beef, Inc., Aurelia | I | Dry Creek Bed | - | - | - | - | 3 Cell Lagoon |
| Alta STP | M | Little Maple River | $BOD_5$<br>$NH_3$ | 0.180 | 10 mg/1<br>2 mg/1 | 12-1-78 | - |
| Alta WTP | S | Little Maple River | - | 0.017 | - | - | Ion-Exchange Backwash Water |
| Schaller | M | Halfway Creek | - | 0.0695 | Controlled Discharge | 9-1-78 | - |
| Galva | M | Halfway Creek | $BOD_5$<br>$NH_3$ | 0.041 E | 10 mg/1<br>7 mg/1 | Step 3 & 15 Month | - |
| Odebolt | M | Odebolt Creek | $BOD_5$<br>$NH_3$ | 0.113 | 10 mg/1<br>5 mg/1 | Step 3 & 15 Month | - |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Selected Casing Odebolt | I | Odebolt Creek | - | - | - | - | Solids Retention Tank |
| Arthur | M | Unnamed Creek | - | 0.038 | Controlled Discharge | - | - |
| Ida Grove | M | Odebolt Creek | $BOD_5$<br>$NH_3$ | 0.267 | 20 mg/1<br>7 mg/1 | 5-1-78 | - |
| Culligan Water Conditioning, Ida Grove | I | Odebolt Creek | - | - | - | - | To Municipal STP |
| Deluxe Motel, Ida Grove | I | Odebolt Creek | - | - | - | - | Septic Tank |
| Holstein STP | M | Battle Creek | - | 0.147 | Controlled Discharge | Step 3 & 15 Month | - |
| Holstein WTP | S | Battle Creek | - | - | - | - | To Municipal STP |
| Robert Bagenstos Slaughter House, Holstein | I | Battle Creek | - | - | - | - | Septic Tank |
| Battle Creek | M | Maple River | - | 0.094 | Controlled Discharge | - | - |
| Danbury | M | Maple River | - | 0.058 | Controlled Discharge | - | - |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Mapleton | M | Maple River | $BOD_5$<br>$NH_3$ | 0.124 | 30 mg/l<br>15 mg/l | - | No Needs |
| Castana | M | Maple River | - | 0.022 | Controlled Discharge | - | - |
| Turin | M | Maple River | - | - | - | - | No Treatment |
| Little Sioux | M | Little Sioux River | - | 0.030 | Controlled Discharge | - | - |
| Charter Oak STP | M | East Soldier River | - | 0.072 E | Controlled Discharge | - | - |
| Ute | M | East Soldier River | - | 0.051 | Controlled Discharge- | - | - |
| Ricketts | M | Middle Soldier River | $BOD_5$ | 0.015 | 30 mg/l | Step 3 & 15 Month | - |
| Soldier | M | Soldier River | - | 0.033 | Controlled Discharge | - | - |
| Moorhead | M | Soldier River | - | 0.038 | Controlled Discharge | - | - |
| Pisgah | M | Soldier River | - | 0.010 | Controlled Discharge | - | - |
| Mondamin STP | M | Spooner Ditch | - | 0.038 | Controlled Discharge | Step 3 & 15 Month | - |

DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Mondamin WTP | S | Spooner Ditch | - | - | - | - | Filter Backwash to STP |
| DeSoto Wildlife Refuge, Hanson County | S | Missouri River | - | - | - | - | Lagoon |
| Early | M | Unnamed Tributary | - | 0.064 | Controlled Discharge | - | - |
| Wall Lake County Home, Early | S | Unnamed Tributary | - | - | - | - | Septic Tank |
| Camex, Inc. Early | I | Sac County Drainage Ditch #68 | - | 001 = 0.15<br>002 = - | - | - | 001 = Cooling Water<br>002 = Sanitary Wastes & Cooling Water To Municipal STP |
| Wall Lake STP | M | Drainage Ditch #60 | - | 0.121 | Controlled Discharge | - | - |
| Wall Lake Processing Corp., Wall Lake | I | Unnamed Tributary | - | 0.003 D | - | - | Septic Tanks |
| Kiron | M | Otter Creek | $BOD_5$ | 0.053 | 30 mg/1 | Step 3 & 15 Month | - |
| Schleswig | M | East Soldier Creek | - | 0.048 | Controlled Discharge | - | - |
| Schleswig Lockers, Schleswig | I | East Soldier Creek | - | - | - | - | To Municipal STP |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Deloit | M | East Soldier Creek | - | 0.028 E | Controlled Discharge | Step 3 & 15 Month | - |
| Arcadia | M | East Boyer River | - | 0.041 E | Controlled Discharge | - | - |
| Westside | M | East Boyer River | - | 0.039 E | Controlled Discharge | - | - |
| Vail | M | East Boyer River | - | 0.066 | Controlled Discharge | - | - |
| Denison STP | M | Boyer River | $BOD_5$<br>$NH_3$ | 0.646 | 10 mg/1<br>2 mg/1 | 7-1-79 | - |
| Denison WTP | S | Boyer River | - | - | - | - | No Treatment |
| Boyer Valley Co., Denison | I | Boyer River | - | - | - | - | Septic Tanks & Lagoon |
| Farmland Foods Inc., Denison | I | Boyer River | - | 0.850 | - | - | 2 Aerobic Lagoons and 2 Trickling Filters |
| Iowa Beef Processors, Inc. Denison | I | Boyer River | - | 1.01 D | - | - | 2 Anaerobic Lagoons -<br>2 Aerobic Lagoons -<br>1 Polishing Cell |
| South Crawford Rural Electric Coop., Denison | I | Boyer River | - | - | - | - | To Municipal STP |

# DISCHARGE INVENTORY

## BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Crawford County Home, Denison | S | Boyer River | - | - | - | - | Septic Tank |
| Meyer Mobile Home Park, Denison | S | East Boyer River | - | - | - | - | Lagoon |
| Buck Grove | M | Unnamed Tributary | - | - | - | - | No Treatment |
| Arion | M | Boyer River | - | 0.023 | Controlled Discharge | - | - |
| Dow City | M | Boyer River | - | 0.057 E | Controlled Discharge | - | - |
| Dunlap | M | Boyer River | - | 0.209 E | Controlled Discharge | Step 3 & 15 Month | - |
| Woodbine | M | Boyer River | - | 0.108 | Controlled Discharge | Step 3 & 15 Month | - |
| Logan | M | Boyer River | $BOD_5$<br>$NH_3$ | 0.118 | 30 mg/1<br>15 mg/1 | - | - |
| Clark Limestone Co., Logan | I | Boyer River | - | - | - | - | No Treatment |
| W.A. Schommer Limestone Co., Logan | I | Boyer River | - | 0.050 D | - | - | Settling Ponds |

# DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Harrison County Home | S | Boyer River | - | 0.352 | - | - | Lagoon |
| Missouri Valley STP | M | Boyer River | - | 0.518 E | Controlled Discharge | - | - |
| Missouri Valley WTP | S | Boyer River | - | - | - | - | To Municipal STP |
| Rath Travelers Inn Motel, Missouri Valley | I | Boyer River | - | - | - | - | Extended Aneration |
| Skelly Oil Co., Missouri Valley | I | Boyer River | - | - | - | - | 2 Cell Lagoon |
| U.S. Air Force Missile Launch Base, Missouri Valley | S | Boyer River | - | - | - | - | 2 Cell Lagoon |
| Iowa Hwy. Commission Rest Area #25R, Missouri Valley | S | Boyer River | - | - | - | - | Lagoon |
| Iowa Hwy. Commission Rest Area #26R, Missouri Valley | S | Boyer River | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Magnolia | M | Willow Creek | - | 0.026 | Controlled Discharge | - | - |
| Sunny Side Village Mobile Home Park, Missouri Valley | S | Willow Creek | - | - | - | - | Lagoon |
| Valley View Mobile Home Park, Missouri Valley | S | Allen Creek | - | 0.015 D | - | - | Extended Aeration |
| Modale | M | Unnamed Tributary | - | 0.037 E | Controlled Discharge | - | - |
| Skelly Oil Co., Modale | I | Unnamed Tributary | - | - | - | - | Lagoon |
| Wilson Island State Park, Loveland | S | Boyer River | - | - | - | - | Unknown |
| Nickerson Farms Honey Creek | I | Missouri River | - | - | - | - | Lagoon |
| Crescent | M | Pidgeon Creek | - | 0.049 | Controlled Discharge | - | - |
| Crescent Quarry | I | Pidgeon Creek | - | 0.700 | - | - | No Treatment |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Union Pacific RR Co., Council Bluffs | I | Indian Creek | - | 0.178 | - | - | Cooling Water |
| Earling STP | M | Mosquito Creek | $BOD_5$ | 0.046 | 30 mg/1 | Step 3 & 15 Month | - |
| Earling WTP | S | Mosquito Creek | - | 0.001 | - | - | Discharge to Storm Sewer |
| Panama STP | M | Mosquito Creek | - | 0.025 E | Controlled Discharge | - | - |
| Panama WTP | S | Mosquito Creek | - | - | - | - | Sanitary Waste to Septic Tank - Settling Tank for Filter Backwash |
| Portsmouth | M | Mosquito Creek | - | 0.028 | Controlled Discharge | - | - |
| Persia STP | M | Mosquito Creek | - | 0.040 | Controlled Discharge | - | - |
| Persia WTP | S | Mosquito Creek | - | - | - | - | No Treatment |
| Neola | M | Mosquito Creek | $BOD_5$<br>$NH_3$ | 0.100 D | 30 mg/1<br>15 mg/1 | - | - |
| Tri-Center Community School, | S | Mosquito | - | - | - | - | Lagoon |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Underwood | M | Mosquito Creek | - | 0.019 | Controlled Discharge | - | - |
| Western Electric Co., Underwood | I | Mosquito Creek | - | - | - | - | Sanitary Wastes to STP |
| Hanson Oil Co., Underwood | I | Mosquito Creek | - | - | - | - | 2 Cell Lagoon |
| Iowa Hwy. Commission Rest Area #029R | S | Mosquito Creek | - | 0.025 | - | - | 2 Cell Lagoon |
| College Heights Manor M.H.P., Council Bluffs | S | Mosquito Creek | - | - | - | - | Lagoon |
| Alto Mobile Home Park, Council Bluffs | S | Pony Creek | - | - | - | - | Lagoon |
| National Cooperative Refinery Assoc., Council Bluffs | I | Pony Creek | - | - | - | - | No Treatment |
| Iowa Power & Light Co., Council Bluffs | I | Pony Creek | - | - | - | - | Unknown |
| Chicago, Milwaukee, St. Paul & Pacific RR Council Bluffs | I | Pony Creek | - | 0.005 | - | - | Cooling Water |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Council Bluffs STP | M | Missouri River | $BOD_5$ | 5.55 | 30 mg/1 | - | - |
| Council Bluffs WTP | S | Missouri | - | 0.500 | - | - | - |
| Council Bluffs School for the Deaf | S | Missouri River | - | - | - | - | Wet Well With Overflow to a Drainfield |
| Beefland International, Council Bluffs | I | Missouri River | - | - | - | - | To Municipal STP |
| Carter Lake | M | Missouri River | - | - | - | - | To Omaha STP |
| Twin City Plaza, Council Bluffs | I | Missouri River | - | - | - | - | To Municipal STP |
| Midwest Walnut Company, Council Bluffs | I | Missouri River | - | 0.0005 | - | - | No Treatment |
| Tonja Mobile Home Park, Council Bluffs | S | Missouri River | - | - | - | - | 2 Cell Lagoon |
| Griffin Pipe Products Co., Council Bluffs | I | Missouri River | - | 0.350 D | - | - | Cooling Water |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Pacific Fruit Express Co., Council Bluffs | I | Missouri River | - | - | - | - | Abandoned |
| Pottowattamie County Home Council Bluffs | S | Missouri River | - | - | - | - | Septic Tank |
| Lake Manawa State Park, Council Bluffs | S | Missouri River | - | - | - | - | To Council Bluffs STP |
| Tennant | M | Keg Creek | - | - | - | - | Septic Tanks |
| Minden | M | Keg Creek | - | 0.177 | Controlled Discharge | Step 3 & 15 Month | - |
| McClelland | M | Keg Creek | - | 0.025 | Controlled Discharge | - | - |
| Glenwood STP | M | Keg Creek | $BOD_5$<br>$NH_3$ | 0.446 | 14 mg/1<br>3.5 mg/1 | 8-1-80 | - |
| Glenwood WTP | S | Keg Creek | - | - | - | - | Lagoon |
| Swift Packing Co., Glenwood | I | Keg Creek | - | 0.490 | - | - | Aerobic and Anaerobic Lagoons |
| Glenwood State School, Glenwood | S | Keg Creek | $BOD_5$<br>$NH_3$ | 0.430 D | 14 mg/1<br>3.5 mg/1 | 8-1-80 | - |
| Glenwood Mobile Home Park, Glenwood | S | Keg Creek | - | - | - | - | Aerated Lagoon |

## DISCHARGE INVENTORY

BASIN - Western

| NAME | TYPE | RECEIVING SEGMENT | PARAMETER | CURRENT DISCHARGE MGD | FINAL PERMIT LIMITATION | COMPLIANCE DATE | COMMENTS |
|---|---|---|---|---|---|---|---|
| Kaser Construction Co. (Glenwood Quarry) | I | Unnamed Tributary | - | 0.140 | - | - | Intermittent Discharge of Quarry Water |
| Pacific Junction | M | Keg Creek | - | 0.062 | Controlled Discharge | - | - |
| Burlington North'ern, Inc., Pacific Junction | I | Keg Creek | - | 0.0002 | - | - | No Treatment |
| Iowa Hwy. Commission Rest Area #035R, Pacific Junction West | S | Keg Creek | - | - | - | - | Lagoon |
| Iowa Hwy. Commission Rest Area #35R East Pacific Jct. | S | Keg Creek | - | - | - | - | Lagoon |
| Tabor | M | Plum Creek | $BOD_5$ | 0.047 | 30 mg/l | - | - |
| Thurman | M | Plum Creek | - | 0.028 E | Controlled Discharge | - | - |
| Thruman Quarry | I | Forneys Lake | - | 0.021 | - | - | Quarry Water |

D = Design

E = Engineers Estimate

M = Municipal

I = Industrial

S = Semipublic